

CTO

The Magazine for Information Executives

MEET THE FUTURE:
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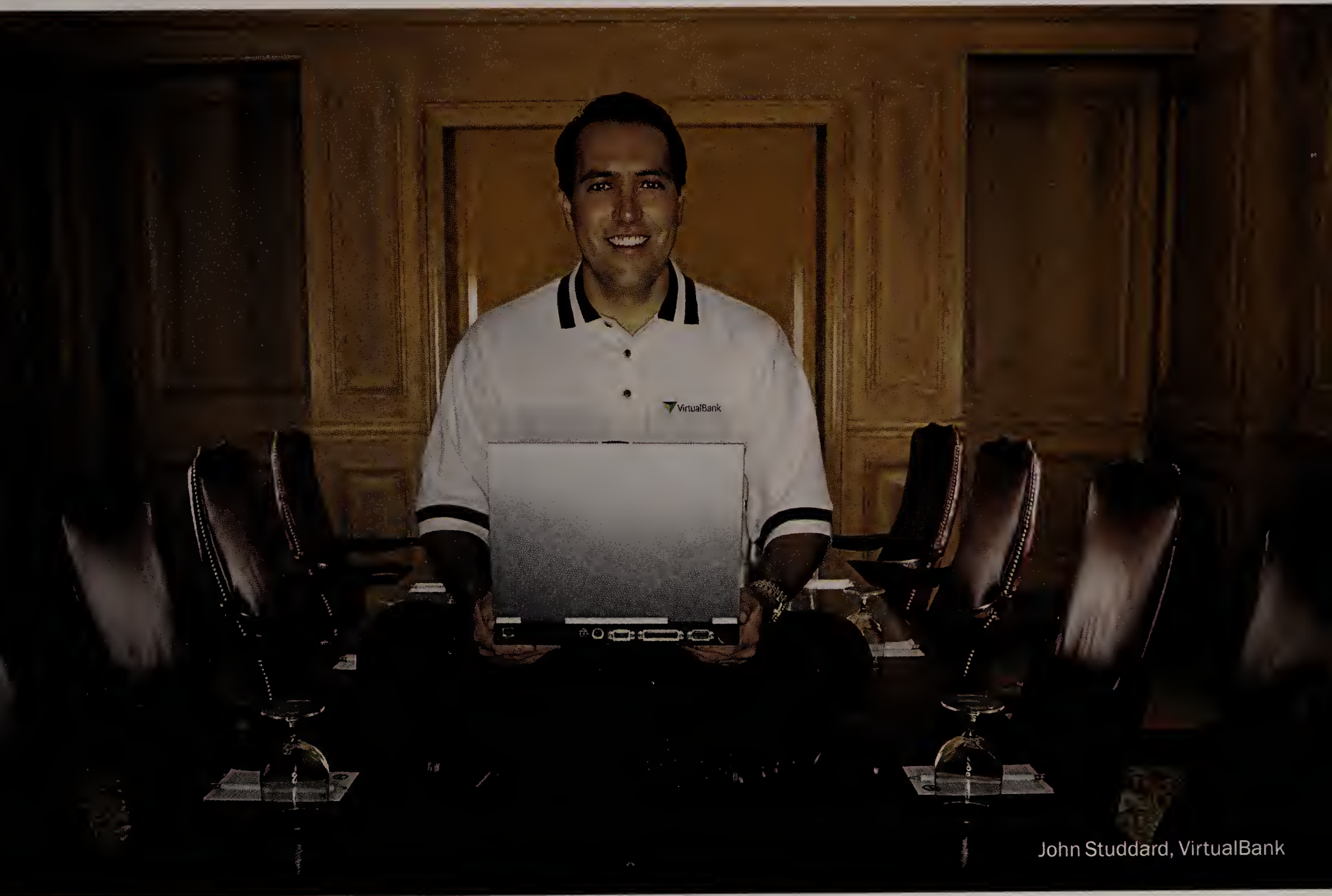
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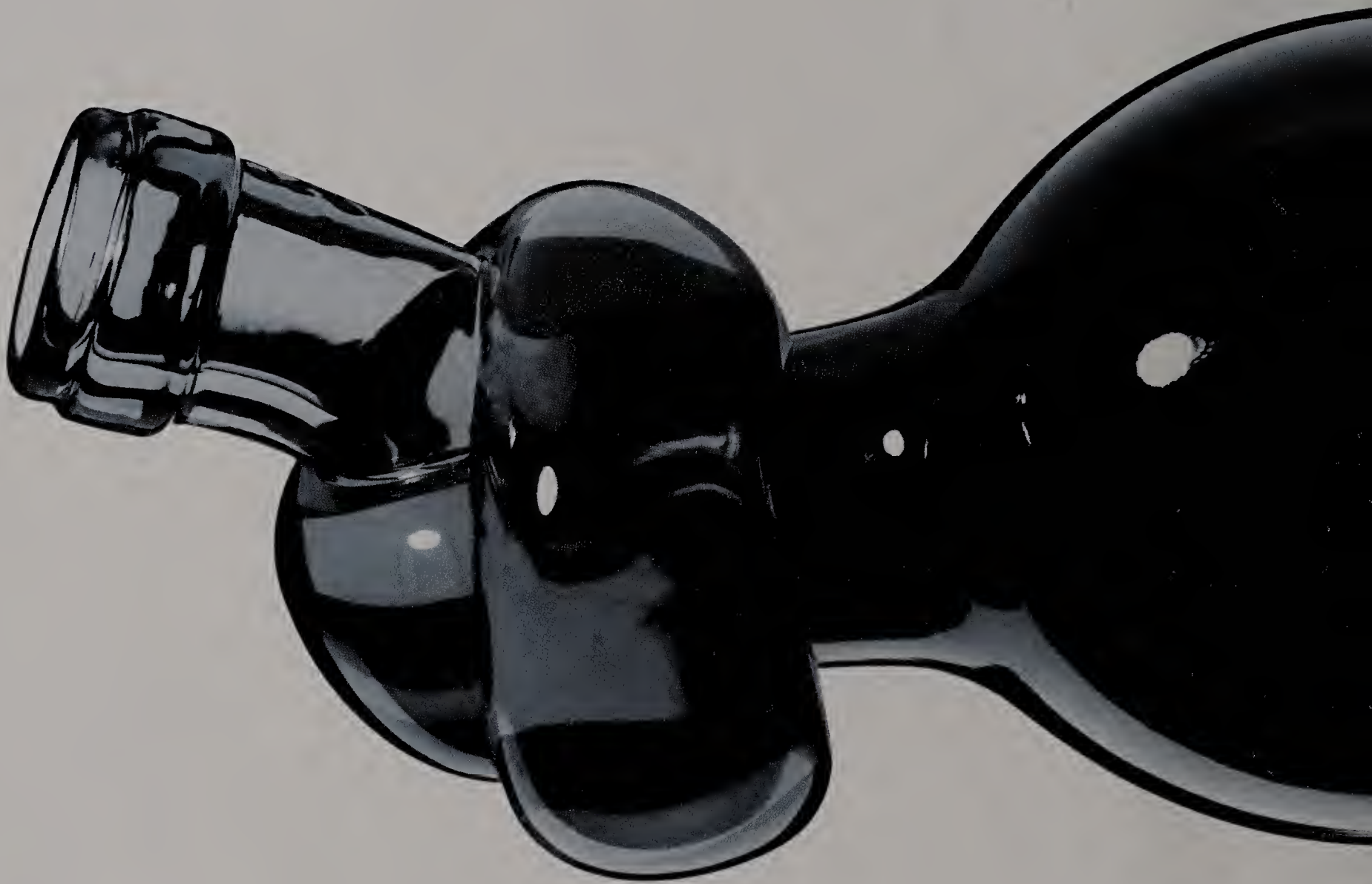
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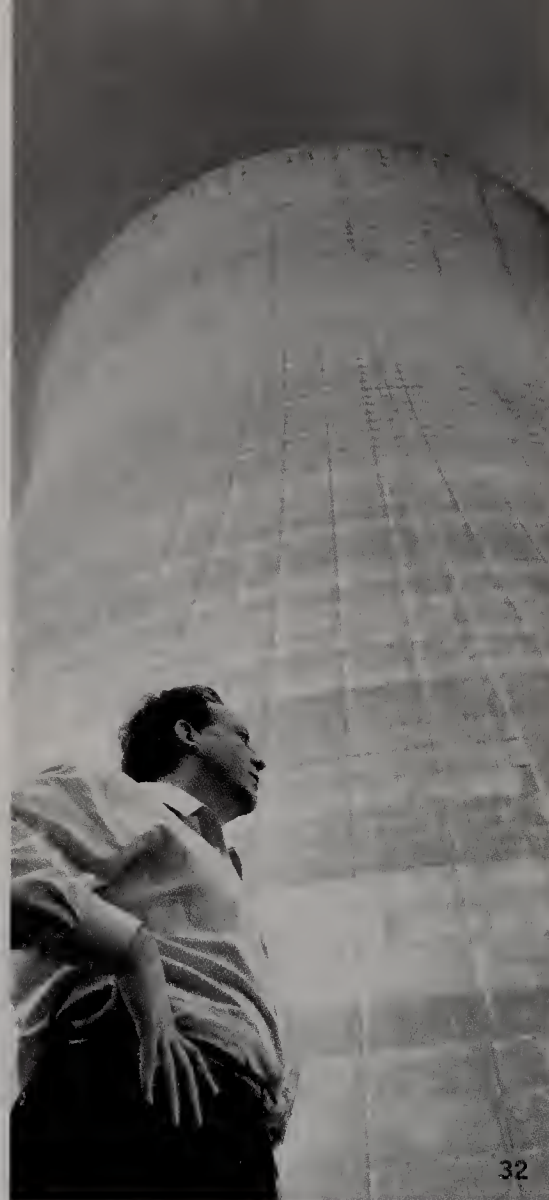
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From the Editor

lundberg@cio.com

Your Brick House

Remember the story of the *Three Little Pigs*? "Little pig, little pig, let me come in," wheedles the wolf. "Not by the hair of my chinny chin chin," the pig stoutly replies. "Then I'll huff and I'll puff and I'll blow your house in!" says the wolf. And the wolf does blow in the house made of straw, and the one made of sticks. But huff and puff as he might, he cannot blow down the house made of bricks. So what's your house made of? And who's the wolf at your door?

Our cover story reports on the rise of the CTO position and its opportunity and threat for CIOs. The opportunity is significant. IT executives looking for a change have a new and exciting career path open to them in e-commerce—one where they get to roll up their sleeves and work on the hottest technologies of our day at startup e-businesses. Others have the chance to lead their existing organizations into the new economy by championing e-commerce initiatives and bringing in new talent to direct those efforts.

CIOs are being courted to sit on dotcom and high-tech boards of directors and even to advise venture firms on the technical viability of their prospective investments. Without question, the opportunities have never been more plentiful, varied and financially rewarding—if your house includes



internet building blocks and the foundation to support them.

Part of the foundation lies in the guts of your organization's existing systems. In the new economy, "the flow of products and services will be intertwined inextricably with the flow of electronic information," writes Executive Editor Derek Slater in our special report on the integrated enterprise, beginning on Page 115. "And the rocky path that leads from today's commerce to that future state has a name: Integration."

While all large organizations are engaged in some type of integration project, the real goal—to get information from anywhere within the organization to anywhere in your company's value chain—remains a holy grail, desirable yet unattainable. But as daunting as it may seem to design a truly integrated enterprise, this is a task that CIOs must take on "before writing another API or buying another web/host integration package," Slater believes.

By the way, if you want to know why I think the hoopla over the CTO position is really just a symptom of the scary changes that are afoot (and not the actual wolf), you'll have to turn to Page 88 and read Senior Writer Mindy Blodgett's article, "The Wolf at the Door."

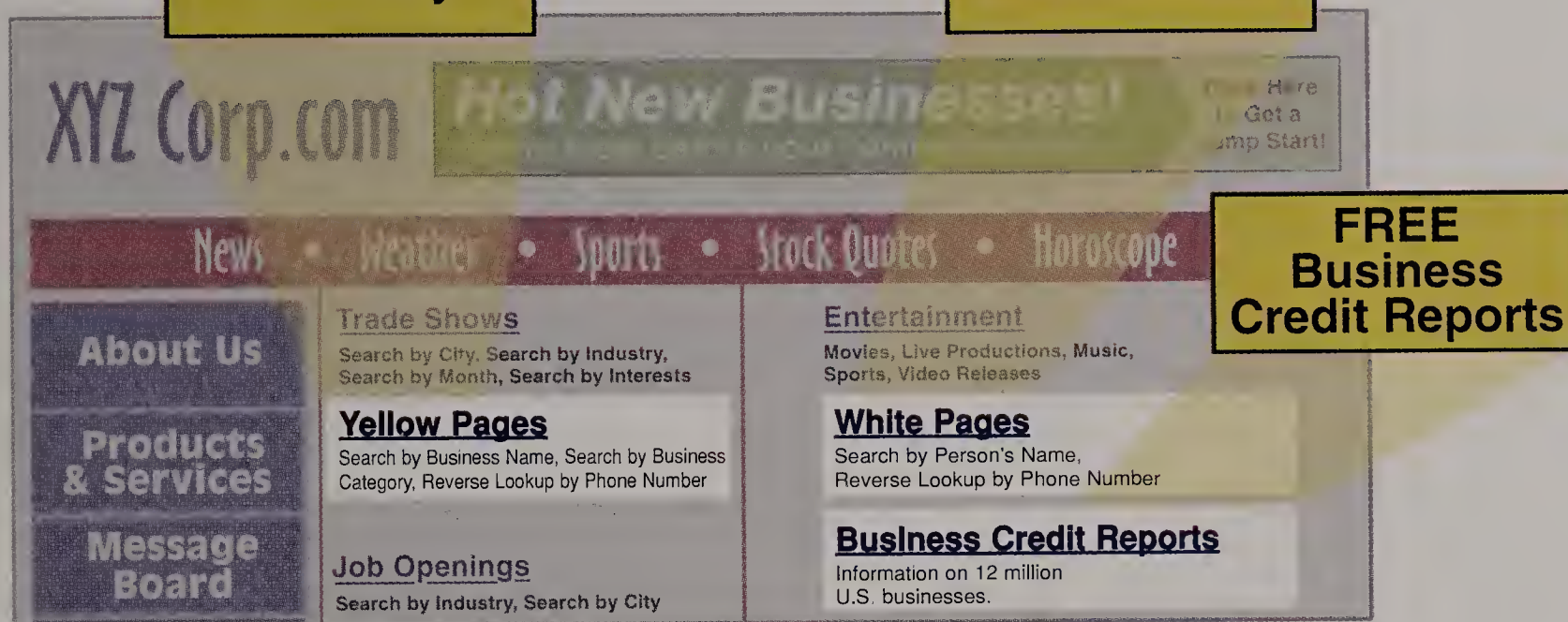
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Reader Feedback

AN UNANSWERED QUESTION

I have spent quite a bit of time as a senior technology person at various companies, and every job leaves me with the same question: What's the vision of the CIO? In any company, there are certain things that computer systems have been expected to do, but in recent years there has been a push to quantify IT's overall business value. Every CIO for whom I have worked has grasped the "business value" IT model and tried to run with it, oftentimes saying, "Our IT organization is going to drive more business value out of the technology." That's not enough, however.

When developing a strong business-centric IT model, it's imperative that the "business" strategy of the organization not only be enhanced but be driven by technology. Most organizations need to be able to move from business paradigm to business paradigm and

have the capability to architect and re-architect the systems with a great deal of ease, a concept that has gotten lost in most IT shops I have been in. In many cases the current technology model should be abandoned for another model, but, because of the pain involved in changing technology at the core of the business, most executives are not willing to do that.

It seems then that the term *business value* means the business is limited by technology, not enabled through it. The simplest way to fix this problem would be to drive a consortium of business and technology people to help coordinate the direction of business and technology. This would enable the CIO and CXOs to shift business paradigms quickly without a great deal of impact.

Scott V. Lombardo
President

SNKL Technologies
scott_lombardo@yahoo.com

TWO SIDES TO THE STORY

Regarding your Feb. 15, 2000, article about the horrors of IT implementations ["Another Trip to Hell"], I agree that many projects fail because

either client or consultants, or both, have failed.

A successful project execution is a tough act. In many cases, these are one-off projects for the client project man-



ager. While the consultant team has generally done several similar projects, the client's specific business issues and work environment are unique. Thus, the combination of a client project manager outside of his or her core of experience coupled with a consulting team that may not appreciate the uniqueness of the situation always faces a major challenge. One of the biggest issues that even a skilled and knowledgeable client/consultant project management team faces is the client organization's uncertainty of what it takes to successfully implement a major IT

project. Challenges that the client/consultant team face include a lack of internal coordination, turf wars resulting in meddling into project activities, politics that change the scope of a project, and a lack of understanding that technology introduction without changes of internal business practices is meaningless.

A successful project is a result of a team effort between consultants and client's staff when the project is well scoped, client expectations are properly defined and there is a structured and disciplined methodology.

And, yes, contrary to the article, discussions between managers and consultants are legitimate and billable project activities. With five to 10 consultants on an implementation project, a weekly status update is a must. (Of course, the other portion of a consultant's job description is to take all the blame when a project goes awry and none of the credit when a project succeeds beyond expectations!)

Matt Chwalowski
Senior Consultant
PHB Hagler Bailly
Arlington, Va.

CERTIFICATION IS OVERHYPED

Certification has never had an impact on whether I hired a candidate [“Paper Chase,” *CIO*, March 1, 2000]. I’ve been consulting for almost 20 years. I’ve spent most of the past eight years working with HP9000/HP-UX systems. Hundreds of résumés have crossed my desk during team creation.

I prefer to turn the certification process around and give candidates two tests: a general Unix test and a plat-

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form-specific Unix test. You'd be surprised at how many "certified" candidates fail the general Unix test.

All certification does is push more incompetence into key management positions, where—I'm sure everyone knows—we already have too many

We have a highly automated facility, but continuous upgrades over the 10-year life of the plant have resulted in mixing programmable logic controllers by Siemens, Allen Bradley and TI with drives by GE, Reliance, TB Woods, Allen Bradley, Baldor and

The more high-tech something is, the greater the probability that it will break down.

folks who can talk a good game but don't know how to do anything.

I agree with Steven Brigham's [CIO of Adaptive Broadband] assessment: Certification is overhyped.

Mark Graham

President

GMI Consulting

Metairie, La.

mark_graham@unxguys.net

THE MAINTENANCE MAN KNOWS

I read with amusement the article on the discovery by many CIOs that ERP doesn't work when they get to the factory floor ["Talk to Your Plants," CIO, March 15, 2000]. Duh! Somebody should have talked to the maintenance people before wasting a bunch of money.

We are a midsize manufacturing facility in a multinational corporation. As CIO, I approve and purchase all computer hardware and software for the offices and for the manufacturing plant. The flat management structure and multitasking that resulted from the new management theories of the '80s and '90s mean that I am not only CIO but maintenance manager, hazmat [hazardous materials] manager, environmental engineer and plant engineer. My programmers consist of a couple of millwrights who we sent to classes at the local community college.

Square D/Altivar. The newer line has an interface by Wonderware that runs on a pair of 486s under Windows 3.11. The older line has an operating system that predates MS-DOS. Transducers by Foxboro, Krohne and Honeywell that used to drive chart recorders now feed information to a multiscreen display and a PC-driven data logger with a custom-designed program.

One thing IT people overlook that every maintenance man knows: The more high-tech it is, the greater the probability that it will break down *and* the greater the probability that repair parts will not be available.

Here's the challenge: An ERP package that can make all of these systems talk to each other and that can show a payback of one year or less. And, oh yeah, we run 24/7 even through holidays because the market is so hot—so it has to be installed and running in eight hours or less while the operators are changing dies in the press.

I recommend that any company considering an ERP system send their information technology professionals to work with the machine operators and the maintenance group on the factory floor for a few months before they begin the design process.

Charles Cramer

CIO

charlesc@jeld-wen.com

DOWN WITH UCITA

There was a charter the conquistadors read to the natives, telling them in Spanish to yield to their legal rule and not hinder them in any way.

I compare that charter to the Uniform Computer Information Transactions Act (UCITA). We are the natives, uncomprehending the legalese displayed within a little scroll-window we are supposed to read before we install the software we purchased the temporary right to use and never own. [See "Is UCITA Good News for CIOs?" CIO, March 15, 2000.]

Another issue is that the UCITA supporters want to stop reverse engineering. This is the only way to break technological monopolies and catch the myriad mistakes and intrusions foisted on us by the smiling suits who are always looking to "leverage" their product up our collective interfaces. We have the power to stop this now before we find ourselves at the mercy of software companies. There's no excuse for letting this become law.

Bill Prine

Technical Writer

Productmarketing.com

Austin, Texas

bill.prine@productmarketing.com

CORRECTION

In "3-D Finally Gets Serious" [CIO, March 1, 2000], we incorrectly identified two sources interviewed by phone together. All but one of the quotes attributed to David Holland, president and CEO of G.Wagen.USA, actually came from David Schweitzer, the acting CIO. To view the correct text, go to www.cio.com/archive/030100_et.html.

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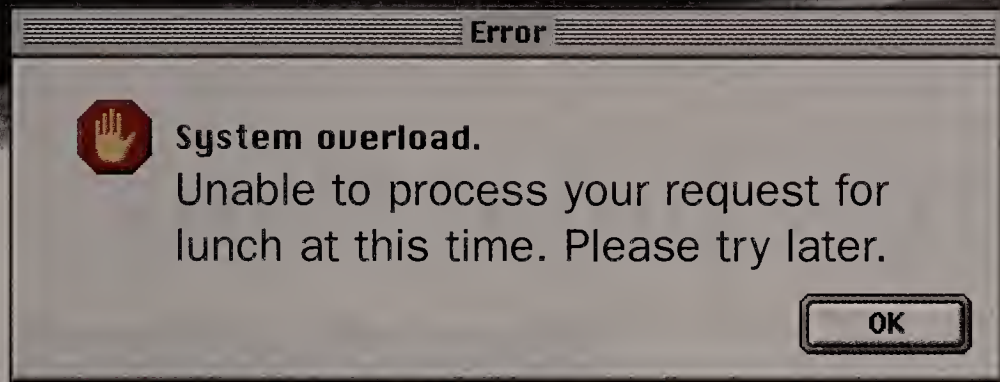
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Edited by Sandy Kendall

R E M O T E A C C E S S

Wheel Time Connections

By Amy Helen Johnson

SCOTT HASSE is an angel to JustAct, a social-justice organization in San Francisco that trains youth leaders for grassroots sustainable-development movements. The former CTO and networking guru, who currently pays the bills working as a Java developer, estimates that he gave JustAct over \$100,000 worth of work within six months of becoming its acting—albeit volunteer—CIO in June 1999. “I wanted

to do work that makes the world a better place,” he explains.

His biggest project to date has been bringing JustAct’s major annual fundraiser, a cross-country bike ride called BikeAid, to the web. Last year, he ran a pilot project that equipped one group of riders with portable devices so that they could send and receive e-mail on the road and write trip reports that were posted on a website.

Hasse had several restrictions on the installation, including novice users. Hasse equipped the riders with the Sharp TelMail device, which is portable, runs on batteries and doesn’t need a modem. Since the riders often camp out, a plug or phone line wasn’t guaranteed. He signed the riders up for the PocketMail service so that they could transfer data by holding the TelMail up to the receiver of any telephone.

Back at JustAct headquarters, Hasse set up a web server (donated by Isthmus Group, a Madison, Wis.-based e-commerce consulting company) to handle the content that riders submitted. Without a lot of



Volunteer CIO Scott Hasse

Department of **BIG,** Scary Numbers

\$10 BILLION: amount U.S. consumers will spend on health-related products online in 2004 **40 MILLION:** number of workers who spend more than 20 percent of their business day in a car **84 MILLION:** number of American workers who drive to work alone **100:** number of terabytes of data that will populate the world’s largest single-system data warehouse once Deutsche Telecom and IBM finish building it. Sources: Jupiter Communications, IBM.

money to throw around, Hasse relied on open-source software to give him up-to-date capabilities for little cash. He created a simplified posting process that allows interns to receive trip reports by e-mail, do basic editing and then paste them onto a webpage.

He plans to roll out a full implementation of the BikeAid site this summer, with five groups traveling with the handhelds. Based on last year’s web traffic, he’s predicting 100,000 page views on the 2000 site—enough to support his hope that BikeAid will get its first corporate sponsor.



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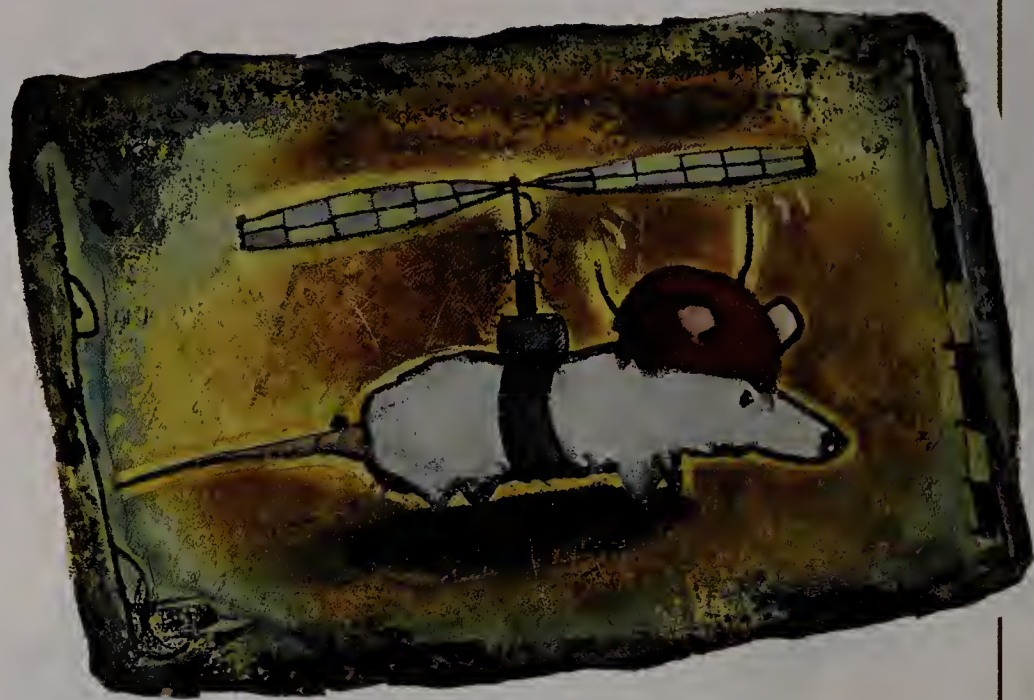
INNOVATION

Get Out There

Got an invention that could revolutionize communications among individuals, groups, companies, performers and audiences (or maybe just between world leaders)? Run—don't walk—to your garage and blow off the dust because time is running out. May 31 is the deadline for entries for the Saatchi & Saatchi Innovation in Communication Award. But beware—the competition promises to be stiff.

In 1998, the first year of this biennial competition, judges had to choose between a hands-free computer mouse, a handheld translating pen, a seismic tornado detector for home owners and a biochip eye implant—and those were just some of the finalists. The winner, New Zealand inventor Leslie Kay, used his experience as a sonar scientist tracking Sonet submarines during the Cold War to create a device that lets the visually impaired use their hearing to see.

Winners get half of the \$100,000 purse in cash and the rest in marketing and advertising expertise from Saatchi & Saatchi's worldwide network. "Our award was intended to be a stepping-stone for an inventor who may not have had the chance to see



their idea showcased before," says Saatchi & Saatchi Worldwide Creative Director Bob Isherwood.

The competition is open to innovators in a wide range of disciplines, including science and technology, the arts, mass communications and education.

—Heather Baukney

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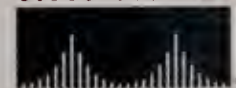
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Washington Watch

By Elana Varon

Time for Digital Government

REP. JIM TURNER, D-Texas, the top Democrat on a House subcommittee that oversees government management, is one public servant who is eager to help. In the hopes of persuading federal agencies to shed their paper-fueled stovepipes and offer integrated online services, Turner is asking private-sector CIOs to share the secrets of their e-commerce success with Congress. "Companies exist now that are virtually paperless. We need to have them come in and tell us how they did it," he says.

Turner backed a recent study by the Progressive Policy Institute, the research arm of the centrist Democratic Leadership Council, that admits there's not much political support for investing in electronic government right now. However, the study, "Digital Government," does suggest that government agencies can benefit by focusing on the issue. And coauthor Robert Atkinson says companies are also missing a chance to promote government efficiency and save themselves money from streamlined business-to-agency transactions. Lawmakers, who decide what IT investment agencies make, just don't know much about what needs to be done so that government develops cutting-edge services, he says.

Most agencies let you download forms, search databases or do research from the



Jim Turner

web, but ideas that would save serious money and time, such as single-point submission of import and export data, haven't gone very far. Turner, who only first started thinking about online government last fall, wants to appoint a federal technology czar—a kind of government-wide CIO—to advocate for such projects.

Turner and **Sen. Joseph Lieberman, D-Conn.**, are both pushing legislation to advance the digital government cause (although they had not yet introduced a bill at press time, and neither lawmaker could say for sure what it would include). Lieberman is also looking for corporate advice. "We don't want to reinvent the wheel," says spokeswoman Leslie Phillips.

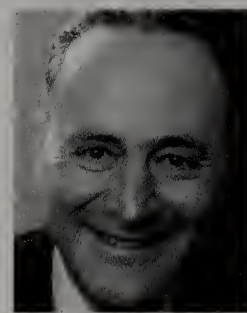
IBM has met with the Senate Governmental Affairs Committee on several occasions, and "anyone else who wants to listen," says Kathleen Kingscott, IBM's public policy director for science and technology in Washington, D.C. "What we're trying to do is help political figures realize this is an issue for governance," she says.

Security Check

THE DENIAL-of-service attacks against Yahoo, eBay and other high-profile websites last winter were followed quickly and quietly by a bill from **Sens. Charles Schumer, D.-N.Y., and Jon Kyl, R-Ariz.**, designed to make it easier to prosecute hackers. The bill would allow investigators to trace hackers across state lines

under a single court order and let prosecutors charge alleged perpetrators no matter how little damage they caused. Current laws demand investigators get separate court orders for each jurisdiction through which they have to trace a suspicious data trail. Meanwhile, suspected hackers can't be charged under today's statutes unless victims can prove at least \$5,000 in damages.

Both changes are supported by the Clinton administration, and Kyl, who chairs the Senate subcommittee on Technology, Terrorism and Government Information, hopes to



Charles Schumer

see the measure enacted this year, according to a source who is following the bill. Steph Marr, vice president of information security with Predictive Systems, a network consulting firm in New York City, says being able to tap the internet is "critical" to enforcing computer crime laws. But he says eliminating the level of damages that trigger a prosecution is "comparatively silly" because companies that are victims don't do enough to protect their networks in the first place. "Are you really going to call the cops if you didn't lock your car and someone stole your CDs?" he asks.

"Here's where the government can play an important role: Make access to information an inalienable right and make it free."

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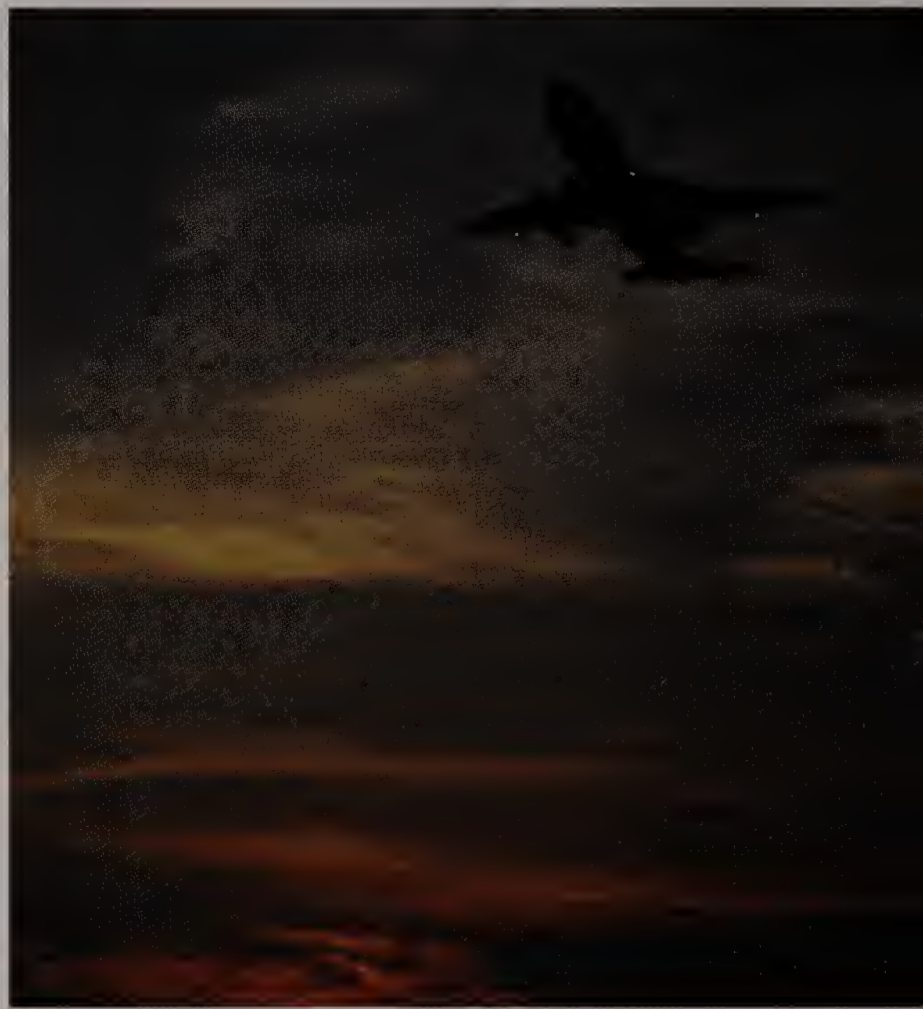
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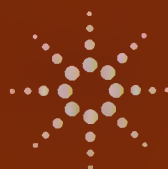


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NETWORKING

Top 10 Trends That Won't Happen in 2000

META GROUP recently released a position paper stating that several technologies billed as "the next big thing" in networking will either never deliver tangible benefits or will require additional maturation before being much use for most organizations. Here are the hyped trends and why you won't see them shine this year.

1 End-to-end IP quality of service Among other drawbacks, current end-to-end solutions will work only in a single-vendor environment.

2 IP-based PBXs These look enticingly low-cost and easy to deploy, but current voice technology is both reliable and scalable and will serve out its five- to seven-year life cycle.

3 Fiber to desktop Pricing for fiber has decreased 50 percent, but the cost of active optical components remains prohibitive.

4 Interactive desktop videoconferencing Lack of quality of service guarantees, poor picture quality and relatively low business value will mean a glacial pace of adoption.

5 Broadband wireless Technological limitations, competing broadband access technologies and regulatory issues contribute to reduced carrier investment.

6 Standard LDAP schemas The standards-setting process is slow and ensuring common schema structure remains a challenge.

7 XML as a net management panacea It won't immediately replace existing frameworks because it's a language, not an application.

8 Free WAN bandwidth WAN bandwidth consumption continues to grow, keeping costs up.

9 Seamless security Scalability remains the big hurdle.

10 IP version 6 Translation requirements and limited motivation for adoption will keep this quiet.

SOURCE: META GROUP'S GLOBAL NETWORKING STRATEGIES SERVICE. FOR MORE INFORMATION, VISIT METAGROUP.COM.

HOT TOPIC



SECURITY

Giving the Finger to Security

By Daintry Duffy

Biometric technologies like retinal scanning or fingerprint authentication still sound to a lot of people like the gadgetry of an Ian Fleming novel,

but IT departments are finding that these high-tech gizmos can have a serious impact on corporate security as well as IT's bottom line.

A number of companies in the biometric technology field are vaunting the benefits of fingerprint authentication, and the recent drop in the price of individual units has technology executives listening. Identix, in Sunnyvale, Calif., is one provider of this technology. Each of its fingerprint scanning units is the size of a credit card and about an

inch thick and can be attached easily to the side of a desktop monitor. The cost has shrunk to \$99 per unit, which can be further reduced to about \$60 when purchased in volume.

According to Grant Evans, Identix's vice president and general manager of IT security, fingerprint authentication not only eliminates password management for the network, it can also control access to documents, stipulating whether they can be forwarded, printed, copied and even how long an employee can look at them. Evans says, "security systems' weakest link has always been identifying who you are because it's been done with passwords."

The City of Oceanside, Calif., has successfully implemented a fingerprint authentication system, deploying Identix's system to its approximately

2,000 end-user workstations. "We've reduced help-desk calls by about 85 percent," says Michael Sherwood, Oceanside's IT director. Sherwood estimates that the department has saved anywhere from \$25,000 to \$50,000 by reducing help-desk calls and problems previously caused by employees gaining unauthorized access to other employees' systems. And the positive response has not only been from the IT group. Sherwood says that employees have praised the ease of use of the technology and that they didn't even need to be formally trained. A user simply places his or her finger on the reader and the fingerprint is authenticated in about two-tenths of a second, providing the appropriate access in a fraction of the time required by passwords.

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FORECASTING

Maybe It's in the Cards

By Daintry Duffy

BEFORE THE annual budget meeting with the CEO, even the most level-headed IT executive may be tempted to glance at the horoscopes in the morning paper. But if advice like "give yourself a break today" isn't quite the revelation you were hoping for, you should check out Silicon Valley Tarot, a fortune-telling card game designed for those who work in the perpetually changing world of technology.

The vividly drawn, 70-card set (created by Thomas Scoville for Steve Jackson Games) includes the "major arcana," archetypes like The Guru, The Hacker and The Mogul, as well as momentous events like Flame War, IPO and The Layoff. There are the "minor arcana," too, 12 cards in each of four suits (Cubicles, Disks, Hosts and Networks), with face cards including Nerd, Marketeer, Salesman and CIO. The set comes with a booklet to help you interpret the cards you draw. Just like a fortune teller's tarot deck, the cards mean different things depending on where they fall in the "spread" and whether they are turned with the picture upright or upside down.

For example, The Hacker indicates "in-

novation, stealth and the ability to do much with little." But if the card is reversed, it augurs "destruction, perversity, immaturity, bad personal hygiene and profound personality deficits." Typically a spread represents past, present and future, so if you turn the reversed Hacker first, you'll be

relieved to know that that's all behind you. If you pull it in the middle to represent the present, you'll be glad you had this information before going into the CEO's office. And if the card represents your future... well, we won't tell.

Visit www.svtarot.com.

LOGISTICS

Sit and Deliver

In spite of the increasingly electronic and virtual cast to our lives, we cling to the ritual of dissecting the Sunday newspaper. When it's not delivered, getting out of bed at all can seem dismal if not pointless.

Subscribers to *The Arizona Republic* no longer need to worry about suffering such catastrophe. The newsprint still arrives on the driveway in the time-honored way, but now the carriers are wired. There's a certain irony in it, but the daily paper's distribution is facilitated by electronic book technology. SoftBook Readers from SoftBook Press assist Phoenix-area carriers to deliver more papers with fewer errors.

"The SoftBook has increased accuracy and reduced our complaints by 50 percent in some areas," says Joe Coleman, product manager of Central News Technology, the company that provides IT support to *The Republic*. Coleman was faced with the task of digitizing *The Republic's* route list almost two years ago, and he found that SoftBook was a great way to bring back-end information to the paper carriers' dashboards. "Before we had it," Coleman says, "the carriers would get a list of route changes every day. They would need 30 to 35 minutes a night just to update their master set of cards." Now they connect their SoftBooks to a phone line at night and route alterations are downloaded securely and automatically from *The Republic's* Circ 2000 Sybase database, telling them who wants two copies, who's away on vacation and the like. They bring the unit in the car with them and "turn pages" as they proceed through their delivery.

For carriers like Dannell Ellington, who fires up her Caravan at 4:30 a.m. to deliver more than 500 papers, the benefits are clear. "Before, I had everything memorized," she says. "But sometimes I'd have to wonder, did that customer come back yet or are they still on vacation? But I never second-guess now." Like other carriers, Ellington can now increase her revenue by also distributing copies of *The New York Times*, *USA Today*, *The Wall Street Journal* and *Investor's Business Daily* because the system lets her track multiple titles and customer sets. The SoftBook has also decreased missed or erroneous deliveries, which cost the carriers \$1 a miss and *The Republic* \$5 to \$7 to correct. So carriers like it, and for subscribers, Sundays just got a little sunnier.

-Heather Baukney



"FINANCIAL SERVICES ARE NOT EXCLUDED; THEY ARE SIMPLY NOT YET INCLUDED."

-David Aaron, U.S. undersecretary of commerce for international trade, in a burst of bureaucratic clarity, on the recent privacy agreement reached by the EU and the United States.

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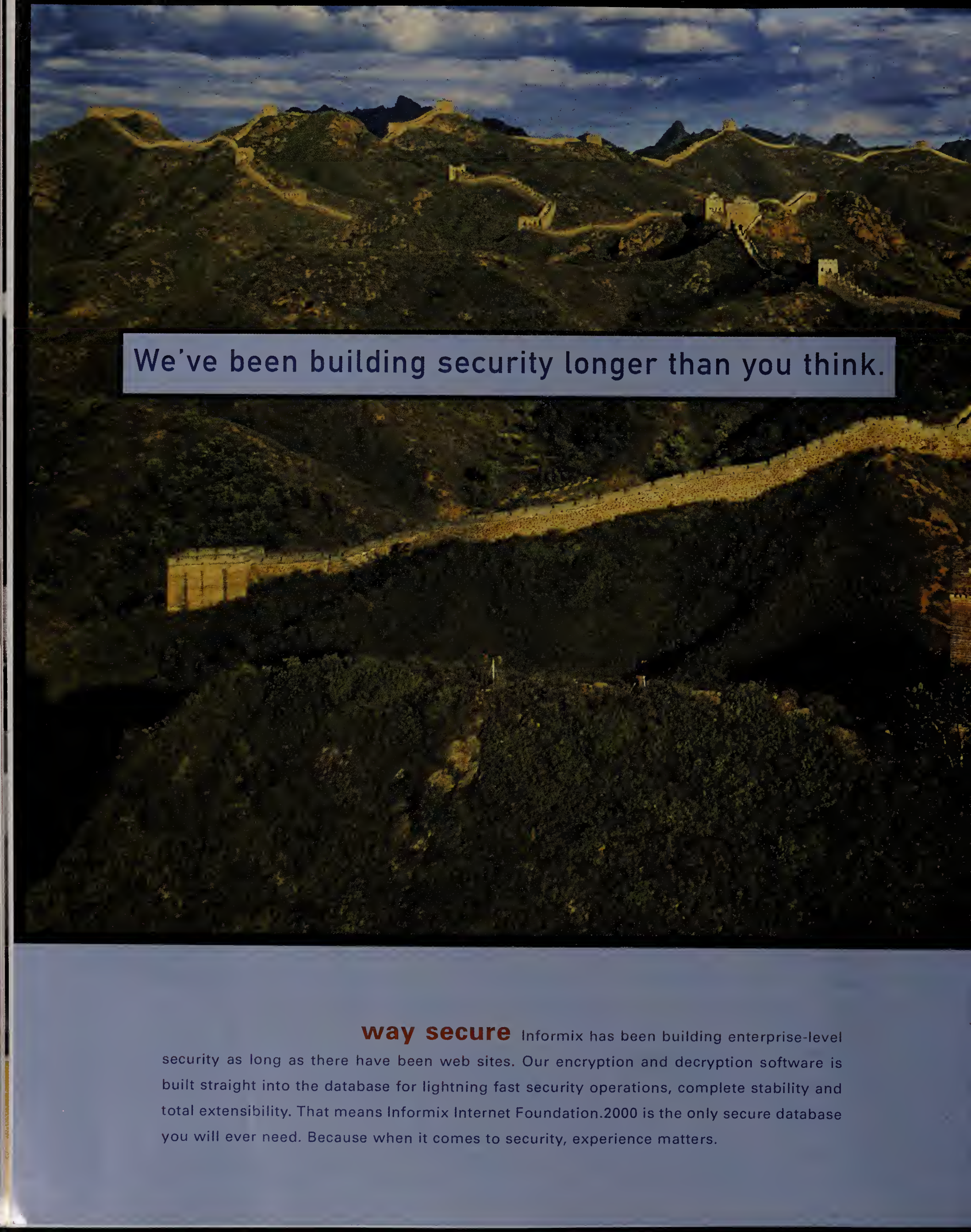
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OFFICE SPACE

Exploring Nuke Frontiers

By Heather Baukney

AT HIS COMPANY'S headquarters, he can ascend one of two 56-story cooling towers on a staircase that winds around the exterior. No, it's not Springfield, U.S.A., and he's not Homer Simpson. He's Bo Wandell, founder and president of SafeHarbor.com. "There's a definite amount of Homer Simpson joking that goes on here," Wandell says of SafeHarbor.com's home in a former nuclear facility in Satsop, Wash. "I just tell people that we're number one in converting nuclear power plants into technology parks."

The site, about 90 miles outside of Seattle,

was owned and operated by the Washington Public Power Supply System until 1994 when construction was abandoned due to lack of funding. Now it's the world's only high-tech park with nuclear site-quality infrastructure.

Since SafeHarbor.com's business is helping companies deliver web-focused customer service, cachet is only one of the advantages of its locale. Because of its past life, the 44,000-square-foot facility boasts extensive systems, power redundancy and network communications connectivity capable of handling phone traffic for the entire United States. "There's a power substation right un-

derneath the site," says Wandell. "We have a diesel generator, and all the telecom hardware and software and all the servers are in fireproof vaults."

Its unparalleled infrastructure wasn't the only reason SafeHarbor.com chose to develop the Satsop site. "We've set out to build world-class infrastructure in a rural community," says Wandell. "CEO Brian Sterling and Bill Miller [chairman of the board of directors] and I all grew up a hop, skip and a jump from Satsop. We're trying to give back to a community that gave us a wonderful upbringing; a community that fell on hard times."

STAFFING

Still Hot for Y2K

The IT staffing crunch just got crunchier. A new poll by RHI Consulting in Menlo Park, Calif., shows that 25 percent of CIOs surveyed say they will be hiring additional personnel early this year. Only 3 percent expect staff reductions—a modest surprise, considering that Y2K has come and gone. These numbers come from RHI's quarterly IT Hiring Index and reflect anticipated first-quarter 2000 trends, as reported by 1,400 CIOs from a nationwide sample of companies employing 100 or more workers.

The results suggest that, while some companies indeed may be laying off IT employees who were dedicated to the Y2K problem, many more are actually staffing up to tackle the backlog of IT projects put on hold until the millennium bug was squashed. Among the hot hiring regions: Greater Chicago and New England, which expect above-average IT employment gains. Among the hot industries: retail and business, and professional services.

For more details from RHI's IT Hiring Index, see www.rhic.com/jobsRHIC/career/trends.html.

—Tom Field

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THAT OF YOUR INTERNET SERVICE, THERE ARE
ALWAYS OTHER WAYS OF COMMUNICATING.**

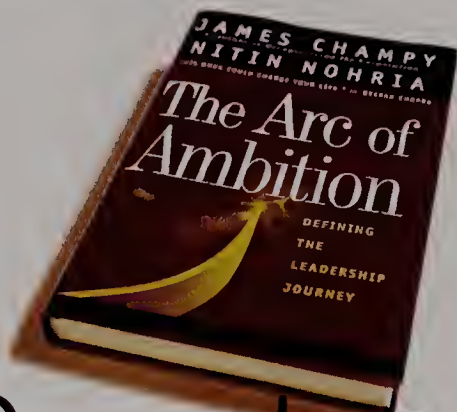
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THE WORLD'S INTERNET COMMUNICATIONS COMPANY

Off the Shelf

Edited by Carol Zarrow



Onward and Upward

The Arc of Ambition: Defining the Leadership Journey

By James Champy and Nitin Nohria
Perseus Books, 2000, \$26

Ambition should have a higher purpose than making money, creating innovative products, capturing market share or winning wars. Ideally, the authors of *The Arc of Ambition* propose, ambition creates leaders who give back to the community and make the world a better place.

What drives ambition, and where can it go wrong? Leaders rich in purpose but weak in values will sink the ship. Others struggle to balance dreams and reality.

The book's chapters are divided into themes, like "seize the moment" and "temper ambition." Rather than preaching the principles, the authors demonstrate them in breezy vignettes, following business icons and social and religious leaders.

The Arc of Ambition brings few new ideas to light, and at times the profiles are more tedious than thought-provoking. Yet the book does provide a fast-paced overview of the mysteries of leadership. Its messages provide inspiration for experienced executives hoping to refresh their sense of purpose and for new execs just beginning their journey.

—Polly Schneider

And...

Differentiate or Die: Survival in Our Age of Killer Competition

By Jack Trout

John Wiley & Sons, 2000, \$24.95

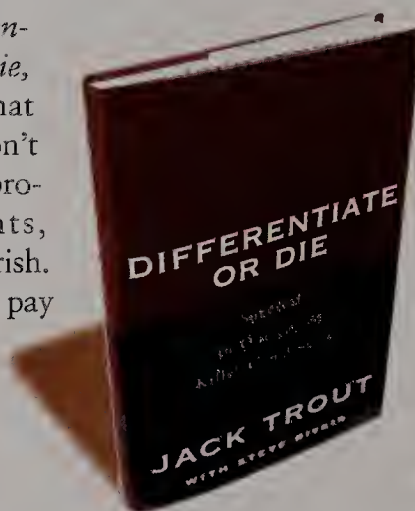
Michael Porter doesn't "get" competition, says Jack Trout. While Porter talks a good game about competitive advantage, he can't teach you how to achieve it. Unlike Trout, says Trout.

First, Trout tells his readers what doesn't work. Quality doesn't work. Everyone expects it. Customer service doesn't work. It's a given.

What does work? Being first. Owning an attribute. Having a specialty. Possessing a magic ingredient.

In *Differentiate or Die*, Trout says that if you don't heed his pronouncements, you will perish. Might as well pay heed.

—David
Rosenbaum



CIO Best Seller List

5.

The Cluetrain Manifesto: The End of Business As Usual

by Christopher Locke, Rick Levine, Doc Searls and David Weinberger
Perseus Books, 2000

4.

The Tipping Point: How Little Things Can Make a Big Difference

by Malcolm Gladwell
Little, Brown and Co., 2000

3.

The New New Thing: A Silicon Valley Story

by Michael Lewis
W.W. Norton & Co., 1999

2.

Leading With the Heart: Coach K's Successful Strategies for Basketball, Business and Life

by Mike Krzyzewski
Warner Books, 2000

1.

Who Moved My Cheese: An Amazing Way to Deal With Change in Your Work and in Your Life

by Spencer Johnson
The Putnam Publishing Group, 1998

SOURCE: April 10, 2000, data, compiled by Borders Group Inc., Ann Arbor, Mich.

VISIT the Reading Room
at www.cio.com/books.

What They're Reading

Jim Cook, vice president of IT services, Child Health Corp. of America, Shawnee Mission, Kan.

45 Effective Ways for Hiring Smart: How to Predict Winners and Losers in the Incredibly Expensive People-Reading Game, by Pierre Mornell (Ten Speed Press, 1998) "I found this one to be very insightful, an easy read, with practical applications." He also recommends *Customers.Com: How to Create a Profitable Business Strategy for the Internet and Beyond*, by Patricia B. Seybold (Times Books, 1998) "It helped me look at my clients from a different perspective."



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—Seth Ostrow, partner and cochair of the patent and trademark department of Brown, Rysman, Millstein, Felder & Steiner, New York City, on the benefits of patent holding.



Selling Subscriptions

By Derek Slater

Most folks don't buy a house by writing a single check upfront; monthly installments are the usual way to make major purchases affordable.

Good news: You can expect vendors of enterprise software applications to catch on to this business basic, according to those wily analysts at AMR Research in

Boston. Enterprise applications include enterprise resource planning (ERP), supply chain management (SCM), customer relationship management (CRM) and e-business software (no acronym yet). AMR Vice President David Caruso says that over the next two to three years, makers of this kind of big-ticket software will move from requiring multimillion-dollar checks upfront to offering subscription-based pricing.

Customers will still have the option of installing and hosting the software on their own systems, so this pricing model is different from outsourcing to an application service provider. The subscription plan will allow customers to smooth out their expenses and also add or subtract seats without major

contract renegotiations, making the software expense more variable depending on the health of their business: Close or spin off a division? The number of seats, and therefore the monthly fee, goes down. Grow like Topsy? Simply raise the fee as seats are added. "From a businessman's standpoint, spreading out payments always sounds good," Caruso says.

Unfortunately for the vendors, they may have to suffer slings and arrows on Wall Street in the transition. Caruso notes that Baan—no stellar performer on the stock market anyway—took extra lumps at the end of last year when the company announced a move toward the subscription pricing model. The problem is the old hockey stick model: Enterprise software vendors typically record the great bulk of their revenues in deals signed right before the end of each fiscal quarter—buyers are habituated to wait until then to get discounts. Since the vendors can't legally record revenue until they've delivered the service, the subscription model means revenue from big, new licensing deals will largely be deferred. Ultimately that will stabilize revenues for the vendors, but in the near term revenues may appear to dip somewhat.

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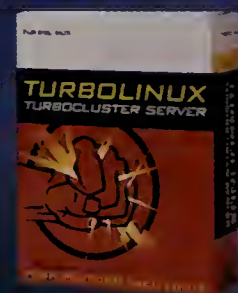
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New Economy

Opportunities and Risk in a Changing World

Break It Up

The era of making things yourself is over. The web is going to create dramatic new efficiencies for manufacturers and their supply chain partners.

BY ERIC JOHNSON

THEY DON'T BUILD supply chains like they used to—and that's a good thing. Henry Ford's vision of putting iron, rubber and glass in one end of his huge River Rouge plant in Detroit and having cars come out the other was visionary for its time—when communicating with suppliers was costly and transportation was slow and expensive. But no more. In the internet economy, old-fashioned supply chains are disintegrating at a lightning pace.

The web is accelerating the disintegration in every industry by eliminating the cost advantages that used to come with keeping everything together under one roof. Indeed, we are rapidly getting to the point where vertically integrated companies will be at a distinct disadvantage when trying to compete with companies that utilize virtual supply chains. Companies held hostage by in-house suppliers will be slower and less able to respond to changing products and markets.

To understand why this is happening, we need to look at the glues that have held supply chains together for so long. Transaction costs with suppliers are just about the stickiest. The costs of establishing a relationship with a third party, such as



qualifying quality, negotiating costs, developing agreements around intellectual property rights and planning for joint investments, can be overwhelming. In fact, simply finding suitable vendors can be a showstopper. For example, in the early days of outsourcing for industries like toys or apparel, managers spent weeks traveling in Asia looking for suppliers.

Once the companies get suppliers on board, there are the routine transaction costs to deal with, such as employing buyers to make the purchases and logistics managers to oversee the flow of materials between the suppliers and the factory. For vertically integrated firms, these transaction costs still exist but are often hidden in overhead structures, giving the impression that it is cheaper to produce rather than to buy.

Digital exchanges are also speeding the disintegration of supply chains by making transaction costs insignificant. They do so by gathering far-flung information together and wrapping

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that information in value-adding services. Much of the recent excitement around exchanges, such as Freemarkets.com in Pittsburgh, has largely focused on the possibility of reducing material costs by pitting suppliers against each other in the cold vacuum of an internet auction. But these websites will have a much bigger impact on reducing the transaction costs of buying components of a product, making it more attractive to buy from outside suppliers than making it yourself. Freemarkets does this by supporting its buyers throughout the procurement process—from finding vendors and developing requests for proposals to running the auction site on bidding day.

Timing and availability of information has also kept supply chains together over the years. But with the web's ability to

big investments in software and infrastructure. Now it is available through web-based portals for a monthly fee.

PairGain Technologies, a producer of DSL networking systems in Tustin, Calif., has experienced many of the benefits of synchronized product management. In the past, releasing new products and making product changes were manual, paper-driven processes at PairGain. It required many meetings and extensive travel between PairGain and its manufacturing partner SCI Systems based in Huntsville, Ala. The labor-intensive activities slowed product development and caused many expensive mistakes. After adopting a web-centric product management system, the need for frequent design meetings evaporated. Both within PairGain and at SCI's manufacturing plant in Brazil, engi-

neers could interact daily with an ongoing dialogue about product content. Synchronizing the management of product content has helped PairGain reduce component inventories from six weeks of supply to a few days.

Virtual supply chain technolo-

Virtual supply chain technologies make it possible to move responsibility for final products to suppliers.

gies are not only making it easy to outsource the manufacture and delivery of products, they will also make it possible to move accountability and responsibility for the final product to the suppliers. Information portals—where all partners can view the whole supply chain and be measured and rewarded for overall success—allow individual suppliers to begin to think like a single entity.

For example, automotive companies are modularizing their products and outsourcing the accountability for delivering whole modules to the assembly plants. With early success in easy modules like upholstery and wheels, some manufacturers are taking the idea a step further. Volkswagen is experimenting with complete modularization, breaking a truck or car into several large modules like chassis, frame, engine and body, and outsourcing each of the modules. In a new VW truck plant in rural Brazil, seven key vendors not only produce the modules but also deliver them to the assembly line and attach them to the truck as it moves down the line. Suppliers aren't paid until the finished truck passes final inspection. VW maintains only a couple hundred employees who manage the partners.

With all that's changed, Henry Ford would have a hard time recognizing the auto supply chain of the 21st century. **CIO**

move vast quantities of information at ever-lower costs, bulky point of sale (POS) data from cash registers can be shipped more often, making daily forecasting more accurate and reducing inventory requirements throughout the supply chain. This will reduce the need for retailers to own large distribution centers to maintain supply, streamlining the flow of POS material from manufacturers to retail stores. Many of these POS tools are offered as services through easily accessible web portals.

Managing complex interfaces between organizations is another reason that many businesses have been reluctant to disintegrate. In Henry Ford's company, all the functional players from R&D to manufacturing were located on a single site in the interest of allowing spontaneous and unplanned information flow between the different departments. During a new product introduction, manufacturing engineers could stroll down to R&D any time questions arose. In highly dispersed supply chains, it has always been hard to create this kind of informal, spontaneous flow of communication.

But now web-centric product-content management systems are eliminating the complex functional interfaces by giving everyone equal access to shared information. Car companies like Ford generate huge volumes of product content information (the data required to manufacture and distribute a product) for each vehicle. This includes such details as the bill of materials, drawings, lists of approved suppliers for each component and process information needed by manufacturing and distribution to build, test and customize the product. Sharing this information holds immense promise for reducing cost. But it used to be too expensive for many companies, requiring

Think you can stay vertically integrated in the 21st century and win? Brag to us at neueconomy@cio.com.

Eric Johnson does research on information technology's impact on supply chains at the Tuck School of Business at Dartmouth College. He can be reached at M.Eric.Johnson@Dartmouth.edu.



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What You Don't Know Can Hurt You

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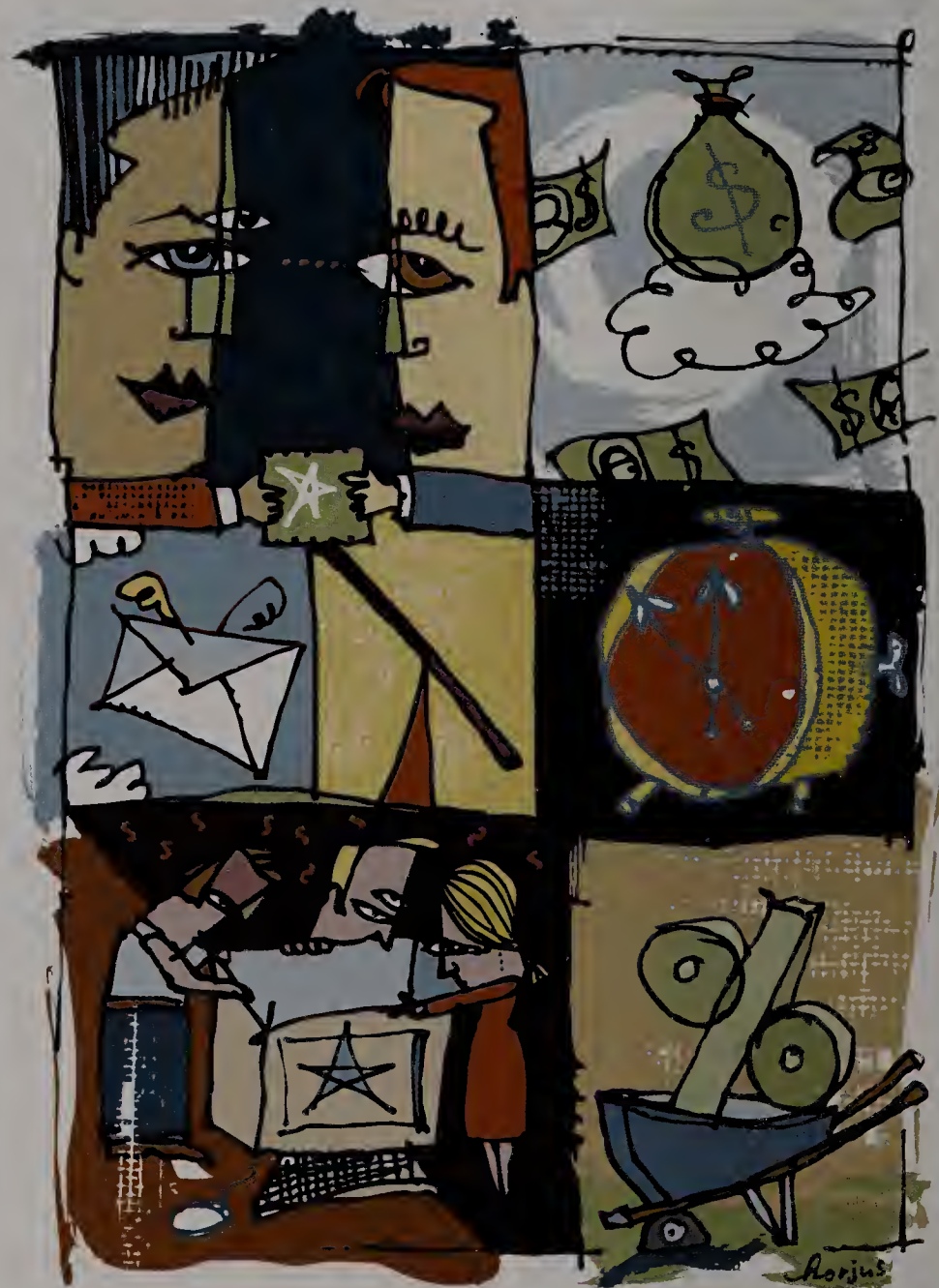
Contractual tips for new entrants
in the ERP game

BY WAYNE D. BENNETT

ENTERPRISE RESOURCE planning implementations are once again in the news with stories of both success and dispute. And we can probably expect more of these stories now that Y2K configuration freezes are thawing in the heat of pent-up demand. Two factors make these stories relevant to all CIOs. First, the ERP vendors are headed down-market in search of new opportunities; and, second, the same contract and management principles that help determine the outcome of big ERP projects apply with at least equal force to smaller ones.

Sure, we see the big guys wielding considerable leverage at the bargaining table and ending up with a decent claim if the implementation fails, but midsize companies have fewer resources to help in case of disaster. A big mistake in a big company is hard to hide and hard to recover from; in a smaller company it's impossible to hide and even harder to recover.

A complete tutorial on ERP could take a full semester and several guest lecturers to cover properly. But if we start with the typical definition of what we want to avoid (over-budget, late, inadequate function or performance or some combination of these), here are a few matters to consider.



Timing

Having a vendor start work before a contract is signed seems so facially stupid that it is hardly worth mentioning except that it happens all the time. Without a contract you have few intellectual property rights, no appropriate confidentiality provisions and you are paying by the hour. Worst of all, you lose leverage in the contract process and you set yourself up for a mess if no deal can be reached.

As you are negotiating, everyone thinks you are saving time by starting early, all the while ignoring that as the clock ticks and your ERP deadline looms, you have either wasted all the work to date (because you now have no rights in the software and therefore no leverage, so you cannot come to an acceptable contract) or you will have to eat whatever the vendor puts in front of you at the end of the process. Given the frequency with which the simplicity of this concept is not recognized, it is hardly

ILLUSTRATION BY PETER HORJUS



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surprising that Halloween Superman costumes come with the warning, "Do not attempt to fly wearing this costume."

Price and Payment

Price is not the most important factor in the success of an ERP project, but you don't really need a money pit. Seek a fixed price and a well-defined change order process. Don't try to chisel every last nickel off the price. You will do better to get a realistic price up front than to deprive the vendor of an honest profit. Otherwise, expect to be pestered with change orders until the vendor puts some vitality back into its margins.

Check references to find out how the change order process went for other customers of your vendor. Did the price increase 10 percent or 100 percent? Did every last pixel change cause a change order or did only the big changes cause a repricing?

As for the actual paying, many vendors are sensitive to the cost of money issue. Holdbacks are great (and should be sought) but if the vendor is a big company, holdbacks have less

an upside or bonus for beating selected metrics that imply success for both sides. Add clear escalation procedures so that disputes of every stripe can be resolved efficiently. Require each side to maintain continuity of personnel and give each side the right (and the right avenue) to suggest to the other side that a key person is standing in the way of success.

Acceptance and Testing

Interim deliverables need to be accepted conditionally, not absolutely. And the condition is that the whole system works in the end. Why accept pretty screens that have no properly functioning software under them? Acceptance and rejection and redelivery processes must be clearly defined in the contract.

Furthermore, you need the right to test what your vendor does; your vendor needs the right to test what you do; and you both need the right to seek third party help to determine whether objective standards have been met. No one should be the final arbiter of his own work. When considering third parties, be sure they are truly independent—not a vendor that would have preferred to have gotten the job in the first place.

Achieving a milestone involves accepting the deliverable, not just the delivery!

real effect than desired. Holdbacks can range from 10 percent to 50 percent and are typically limited by the vendor's margins. They are intended to keep the vendor's skin in the game. If payments are made upon key milestone achievements (and achieving a milestone involves accepting the deliverable, not just the delivery!) a fair amount of money can accumulate in the holdback by the end of a large project. But seeking your money back versus not paying the holdback yields the same result when up against a large vendor—it's a lawsuit either way.

Contract Leverage

Having a tight contract that permits you to declare a breach and then terminate it is a swell thing. But in the end, do you want an ERP system or a contract claim? You may need your termination sledgehammer, but using it will hurt you at least as much as your vendor. Most often, you need a contract that invites conformity to terms that are well tailored to success. Your vendor will say that you don't need a contract that causes everyone to keep running back to check its terms. That's only partly right. You want to keep people from only delivering to the letter of the contract, but you also need a contract that would, if read, invite the parties to work together.

Get actual, specified monetary damages for material failures (materially late, materially nonconforming) and consider

Backlash

At the risk of contravening some of the other principles, take them with a grain of salt. It may be easy for the CIO to declare that the cleanest implementation involves the fewest legacy interfaces and the least customization—everyone must either conform to the out-of-the-box ERP solution or reveal that she is not committed to ERP. But despite the grief of legacy systems, sometimes you will need to bend. In some cases, the in-place business process is not only unique, it lends a competitive advantage or is simply too expensive to change to conform to the new ERP system. Seek advice from others as to this trade-off. It has operational, cost and political consequences.

Throughout all this, don't forget that ERP cuts across the long-established and hard-earned fiefdoms tucked away in every nook and cranny of your company. Before you even begin, be sure department leaders understand what ERP is and not only what the benefits are but what the sacrifices are: Some current processes must change to simplify the system and to conform it to the rest of the organization.

There are surely other issues—each success and disaster brings its own lessons. But you can get a good start by thinking about how these ideas apply to your organization. **CIO**

What's your take on ERP contracts? Let us know at fineprint@cio.com. Wayne D. Bennett is chair of the Commercial Technology Practice Area at Bingham Dana LLP.



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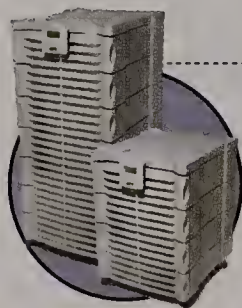
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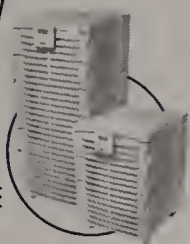


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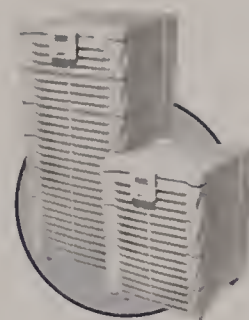
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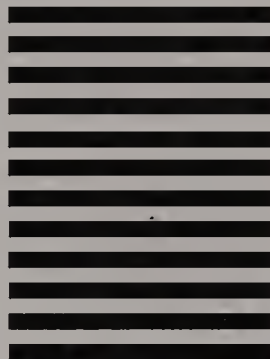
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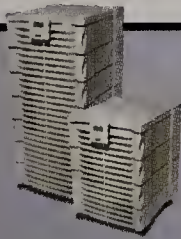
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Career Counsel

Mark Polansky Offers Advice to Aspiring CIOs and IT Managers

Attendance Not Required

Q: I am the director of IT in a \$1.5 billion family-owned company. I was brought in 18 months ago when the company was growing from roughly 500 employees to more than 2,700—all within the span of two to three months. At the time of all this change, I was included in all planning meetings.

Now it seems the only time I am called into a meeting is after a decision has been made, and I am not included in strategic meetings. I enjoy the company and the people, but it seems the reporting structure (to the CFO) and lack of involvement are a hindrance to growth. I've made it clear to the CFO that my ambitions are vice president and beyond. Is there anything I can do to alter this old-model thinking? The infrastructure and processes that are in place are functioning well, and I can't think of any faux pas that I might have committed.

A: It sounds like you were being included during that initial period of high growth to ensure that the infrastructure scale-up would be taken care of. The tip-off was there 18 months ago when you learned that your position reports to the CFO. Since you seem to like the company and the people, it's prob-



ably worth a couple of very good serious tries to open some minds before you throw in the towel and move on.

Seek out a business partner if possible, and go looking for some exciting and low-risk, small-cost places to make a very real difference in the top and bottom line performance of the company. Carefully document what you've achieved and take it to the top, dragging along the CFO if you must. And show the boss what his competitors are doing with technology to provide better-quality products and better customer service, and to better connect with business partners and customers through the internet.

SHOULD I STAY OR SHOULD I GO?

Q: I work as vice president of IT in a relatively new yet innovative private sector bank in India. The bank has launched a number of retail technology products and is known to be fairly

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for Americans, especially
if this teleworker inte-
gration thing really takes off.

—THOMAS JEFFERSON [FOR THE MOST PART]

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Career Counsel

aggressive. I report to the IT head, who in turn reports to the CEO. All other personnel in IT report to me. My current job is somewhat safe yet I do not see many growth opportunities. The largest French bank (that is going to start up a retail banking operation in India) has approached me. There is great challenge as well as uncertainty, as it has never done retail banking thus far. I want growth and challenge, but I value security as well. Could you please advise me whether to continue or take the plunge?

A: There is no simple answer to your dilemma. The balance of risk and reward is truly an individual equation, and what may be the correct choice for you may be a terrible choice for someone else. And security for you may mean something very different from what it means to me. Listen to your own wants and your own needs, and not to what anyone else thinks—and good luck in whatever you choose.

The very best source of career feedback, including readiness evaluation, is a mentor who is committed to and capable of being candid, objective and comfortable giving constructive criticism as well as positive reinforcement and encouragement.

TRADITIONAL CIO VERSUS STARTUP CIO

Q: I'm an IS director of 10 years with strategic and tactical responsibilities, and I've just been laid off because of a merger. I've known this was coming and started looking for another position within the last two months. I've got a tremendous severance package, so there's no hurry to land another job. However, in the last two months, the majority of "offers" have been for startups of various sorts. I'm beginning to wonder if the traditional IS director/CIO position is becoming extinct. At least it seems very difficult to find. Also, is there any advice you can give as to how to qualify a startup as a good prospect to work for?

A: In response to your concern regarding the lack of IS/CIO activity in your job search during the past two months, these were the holiday months of November and December. This year-end period is a very busy time to finish up searches and employment deals that are already in the pipeline, but fewer new senior corporate searches are launched during this time. The start of the new year should prove to be busier for you.

Having said that, the frenetic pace of technology startups doesn't seem to respect the calendar. It's 24/7 activity for

available venture capital to find the good ideas and for startup companies to find good leadership. Speaking of finding good ideas, dig into the backgrounds and track records of the backers and the management team of a technology startup company to gauge its probability of success. Trust your gut and the feedback of those you trust as to whether the idea is good or not.

CAREER FEEDBACK

Q: I have been a project manager in applications development for 15 years. I feel I am ready to move to the next level. In a previous response to a question about readiness in pursuing a director or CIO-level position, you stated that an independent evaluation of that readiness might be appropriate. Where does one obtain an independent evaluation?

A: The very best source of career feedback, including readiness evaluation, is a mentor who is committed to and capable of being candid, objective and comfortable giving constructive criticism as well as positive reinforcement and encouragement. If you don't have a mentor, seek one out—preferably someone outside your own company or at least someone who is not above you in your direct reporting chain. Look for a mentor in industry groups and associations, or call into a neighbor

company and do some networking of your own. Your mentor should be someone you admire, both for his or her career accomplishments but also for leadership, values and style. Regardless of whom you choose, assure yourself that this individual is truly honest with you and not just saying what you want to hear. Second opinion? Your boss, of course. Third opinion? A good IT specialist search consultant.

YOUTH MOVEMENT

Q: I am a young person in a senior position in a top 10 IT and management consulting/accounting organization. I manage many people, projects and budgets. I believe I'm on the fast track to the director level, which means I will be a director by the time I am 30.

My only complaint is that I don't have a manager, so I feel I am always reinventing the wheel with my people. I outsource myself as CIO-CTO to companies that are without one. Several of these companies have approached me about becoming their CIO-CTO on a full-time basis.

My concern is that they do not know how old I am. Will it scare them off if they find out that a 25 year old, out of col-

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O B J E C T S P A C E

The Power Between.

Career Counsel

lege for a little over two years now, is at the helm? Would I be better off remaining in the consulting company and becoming a director?

A: Wow, what a wonderful problem to contemplate! To begin with, let's focus on the fact that you can and are routinely doing the bulk of the CIO-CTO job today, at least on an interim basis. Yes, there are differences—some significant—for a permanent executive, but that just says there's still much for you to learn by making the switch, sooner or later. Second, if you are good at what you do, what does it matter how old you are? At worst, your youth may lack some wisdom based on depth of experience and lack of "seasoning." At best, your two-plus years of intense "Big 10" experience has given you more than

Have a career question?

Visit our website at www.cio.com/forums/executive/counselor.html and pose your own questions to Mark Polansky.

two years' worth of learning and growing, not to mention a variety of experiences. Third, your clients have seen you perform and deliver, and they want you despite your age, and guess what: They probably know and they probably don't care. If you love consulting, then stay. If the idea of being a corporate CIO or CTO is tugging at you, then jump right in.

ANOTHER EDUCATION MOVE

Q: I'd like to follow up on the April 1, 2000, question about the director of IT who was wondering how he or she could make the move from an IT professional/management position to an IT educational/teaching position at either the college or high school level. And the answer: "...The world of education can be an extremely rewarding one despite its lower pay scale and lack of equity possibilities. But it is culturally and environmentally very different from what you have been accustomed to." I'm an IS director in the same boat, and I'd appreciate your expanding on the cultural and environmental differences you referred to.

A: There are several generalized differences in culture and environment between industry and academia. The most commonly cited is the notoriously slower pace in the academe that is caused by committee-oriented decision making and bureaucratic management, especially in public institutions and complex funding models. And with no profit and loss or share-

holder value concerns, the educator is free of the pressures of corporate life, and the world of education therefore tends to attract a more passive academic profile, in both faculty and administrative personnel.

On the other hand, great school and university leadership can be as intensely focused on both qualitative and quantitative (for instance, enrollment, contributions, academic rankings and so on) metrics as their industry counterparts.

E-COMMERCE TRANSITION

Q: I manage a \$50 million print department and have developed many skills in a marketing operations business environment. I have been with this company for about 24 years and have an excellent relationship within the corporation and management, but the company is for sale.

I have been approached internally to manage a team for our recently developing e-commerce department. My concern is that if a company buys us with an e-commerce business already in place, my new e-commerce department may disappear and I'm out of a job. However, do I take the risk, jump in and get the business skills and knowledge so that if it goes badly, at least I will have these new skills in demand added to my résumé for future opportunities?

A: You have absolutely nothing to lose and everything to gain by taking on responsibility for the e-commerce department. Yes, if the new owner doesn't need your services, you will leave the company with new experience and skills to put on your résumé—experience and skills that are very much in demand today and for the foreseeable future—plus the likelihood of a severance package along with strong prospects for immediate employment.

On the other hand, given the scarcity of good e-business people, it would be far more likely that the new owner will want to keep you on. In that case you can even negotiate a bit for a good deal to stay. And if your current employer is a public company, it's also likely that your stock options, which may be considerable in light of your 24 years of service, will vest upon change of control. The last thing you want to do is continue managing a legacy operation, the print department, at a company that is for sale—talk about being expendable! **CIO**

Mark Polansky is a managing director and member of the advanced technology practice in the New York City office of Korn/Ferry International. He has also been recently named the chairman of the Greater New York Chapter of the Society of Information Management. The web-based Executive Career Counselor column (found on CIO.com) is edited by Web Research Editor Kathleen Kotwica. She can be reached at kkotwica@cio.com.



PHOTO BY ANDRE SOUROUJON



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A man in a dark room is looking out a large window with a grid pattern. Two giant pandas are visible through the window, one on the left and one on the right. The man is sitting in a chair, looking out the window. The text "yet he won't remain online for eight seconds" is overlaid on the image.

yet he won't remain online for eight seconds

he'll wait years for the possibility of baby pandas,
purchase a 'how to mate mammals' primer.

it's a bear managing a web site, isn't it?

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*Nature Conservancy CIO
Doug Barker partners with
IT companies to save the earth's
last great places.*



COMMON GROUND

*Doug Barker's successful quest to find
IT partners for his nonprofit environmental group yields
profitable lessons for any company's CIO*

BY ELAINE M. CUMMINGS

Doug Barker is not your typical activist, nor is he your average business executive. As vice president and CIO of The Nature Conservancy—the Arlington, Va.-based nonprofit environmental preservation group—Barker has the ambitious task of leveraging limited resources to build a better world. And while he doesn't measure success with

Reader ROI

- ▶ Learn the value of partnering with nonprofits
- ▶ Find out how to improve your partnering experiences
- ▶ Discover where to look for partnering opportunities

PHOTO BY KATHERINE LAMBERT

bottom lines, Barker's experience putting his passion to work to overcome holes in his IT pocketbook yields important insights into building business relationships based on common interests—like saving the planet.

THANKS TO IN-KIND CONTRIBUTIONS from some of the top IT companies—among them, Intel, Microsoft and Hewlett-Packard—Barker is able to utilize the hottest new technologies to protect what he calls the last great places on earth. Whether he's focusing on fundraising management or GIS implementation, Barker has discovered that partnerships with landowners, governments or corporations can be the most powerful factor in achieving his organization's goals.

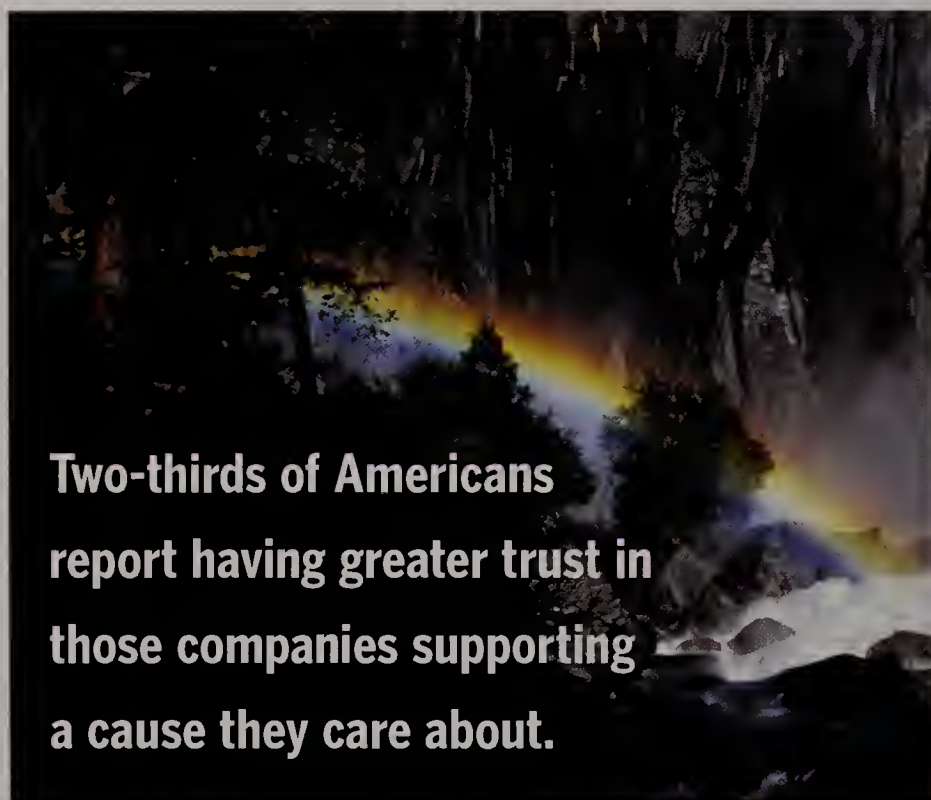
In turn, creating a partnership with The Nature Conservancy and other nonprofits is an outlet for companies looking to affect something more than their bottom line. "When

emphasized community as well as investors outperformed by a factor of 756 those that paid attention to the bottom line only.

In addition, a joint study in 1999 by Cone, a strategic marketing company based in Boston, and Roper Starch Worldwide, a research company also in Boston, found that companies that partner with nonprofits experience bottom-line results through increased sales and long-term customer and employee loyalty.

Barker feels strongly that the partnership model is one that can benefit every kind of organization. "Utilizing partnerships wherever possible and really doing more with less is the way that you make things happen," he says. "And there are lessons there for everyone."

Companies like Intel want to contribute to health, safety and environmental causes for a variety of reasons, some of which aren't directly related to the bottom line. "By effectively partnering with organizations such as The Nature Conservancy, Intel creates goodwill for itself, increases public awareness of the cause and learns a lot in the process," says Terrence Mc-



Two-thirds of Americans report having greater trust in those companies supporting a cause they care about.

For Cause

Some companies see "doing good" as a way to build long-term brand equity and grow bottom-line results

THE FOUNDERS OF THE HOME DEPOT believe that "doing the right thing" was integral to their business success, so they built community service into their corporate culture.

TIMBERLAND ENCOURAGES EVERYONE to "make a difference" through a strong, 10-year relationship with the volunteer program City Year.

FOR DECADES, DAYTON HUDSON, the parent company of Target, has been a recognized leader in corporate philanthropy, giving 5 percent of its pretax profits to charity, versus the average 1 percent to 2 percent other companies donate.

SOURCE: 1999 CONE/ROPER REPORT

Microsoft donated web development to our Washington field office," says Barker, "it was in part to demonstrate their web offering capabilities, and it was in part because they were so interested in beautiful places."

We don't traditionally think of do-gooding as part of a corporation's economic picture, especially when faced with the financial pressures of managing a business. But if you think that the only responsibility of a business is to its stockholders, consider this: According to the research of two Harvard Business School professors, over an 11-year period companies that

Manus, Intel's environmental, health and safety signature projects manager in Chandler, Ariz.

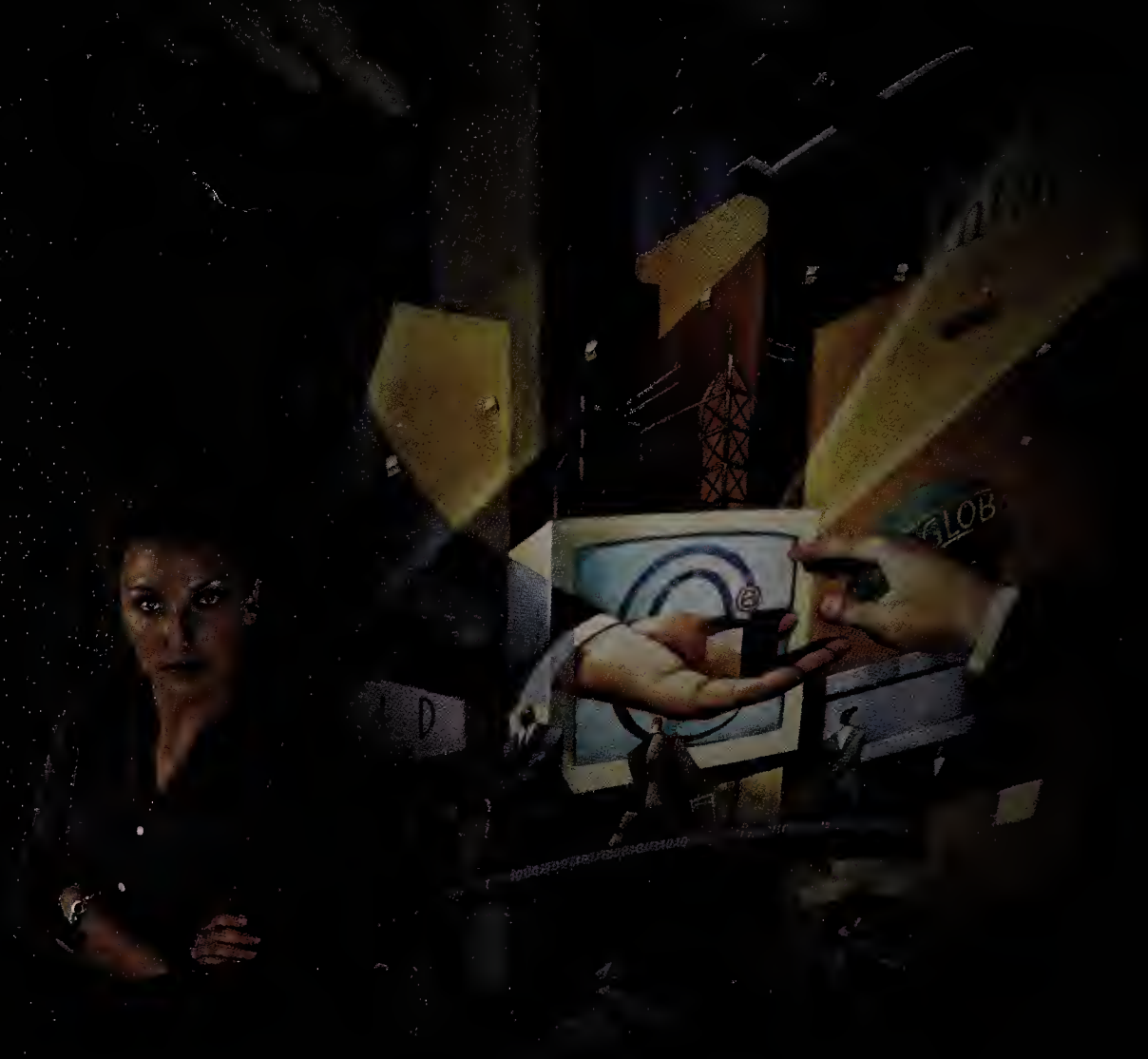
Intel chose to partner with The Nature Conservancy for a couple of reasons. The company wanted to contribute to the community but didn't want to have to create its own community organizations to do so. "It made more sense to link to a well-established organization with a track record," says McManus. Intel would also rather work together with a nonprofit than just write a check, he says. And the reason is simple: "Some partnerships showcase a particular technology and

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demonstrate to other companies what we can do," he says. "Plus I get particularly engaged when I can go to a nonprofit and ask, 'Can I help you use some Intel technology and capability to improve the world in which we live?'"

With The Nature Conservancy, Intel is focusing on a project that gives science students a virtual opportunity to tour some of Earth's untouched wilderness. "The partnership taps into Intel's goal to advance education and represents an excellent foundation for developing future members of The Nature Conservancy," says McManus.

There is no way to measure any hard returns to companies like Intel for their work with nonprofits. "That sales go up because we've helped The Nature Conservancy—I don't expect we can measure anything like that," McManus says. "But I'm sure that the more we all work together and share ideas, the more we'll be able to harness the power behind new technologies and make a much better world for all of us."

One for All

It's no longer about being just loosely associated with a cause

It was very much a personal decision when Doug Barker joined The Nature Conservancy six years ago. "I wasn't attracted necessarily to a nonprofit," says Barker. "I was specifically attracted to The Nature Conservancy as a means to combine my professional expertise with something that I held near and dear to my heart: the conservation of our natural world."

The Conservancy is the world's leading private, international conservation group (see "Doing Well By Doing Good," *CIO*, April 1, 1995). With more than 1 million members and 1,300 preserves, the Conservancy has helped protect 11.6 million acres of ecologically significant habitat in the United States and more than 60 million acres in Asia, Canada, the Caribbean, Latin America and the Pacific.

A member of the Conservancy for his entire adult life, Barker was working at Andersen Consulting when he called the

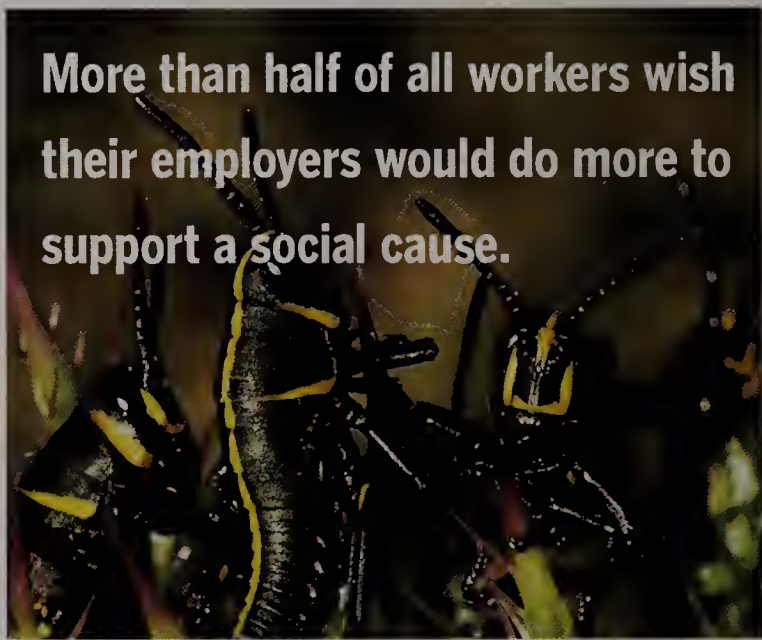
Conservancy to offer some advice, "and the conversation just kept going," he says. A year later, the nonprofit offered him the job of CIO. And he knew instantly it was a perfect fit.

The surprising part for Barker was, in leaving the hectic, fast-paced consulting arena for a nonprofit, he expected that he would also be leaving a lot of the stress behind. But the opposite happened. "I found myself caring really deeply about what we do, and that made me want to do more and do better and really push myself in ways I wouldn't have pushed myself if it were just for more dollars," he says. "I mean, money is good. But how much money do you really need?"

By working for such a large organization, Barker faces the challenges of any CIO at a similar-size for-profit enterprise: keeping technology aligned with an organization's

THE INSECT-TRACKING BUSINESS ONCE required two scientists—one to follow the bug and call out its behavior, another to capture each activity with a clipboard and pen. But because of HP's gift to the Conservancy of more than 250 handheld computers (worth about \$600 each, for a total of \$150,000), on-the-ground staff are able to instantly enter field data about rare plants and animals, eliminating the need for hundreds of additional hours of inputting and checking data. "What was formerly a complicated process that left lots of room for error is now handled easily by one person," says Barker.

But why would a company like Hewlett-Packard care about counting butterflies? According to the Cone/Roper report, which surveyed 2,000 random American consumers, 35 percent of Americans say their biggest concern is the environment. "As corporate leaders, CIOs and other executives need to



More than half of all workers wish their employers would do more to support a social cause.

goals and tactical plans. What is different, however, is how the two types of organizations measure their viability. "At a nonprofit, we can measure how successful we are at fundraising, but we don't have an easy way to measure how well we're doing against what we're trying to do," he says.

When looking at the ROI on IT investments, it's difficult to say what the net effects of any enhancements might be. "It's not easy to calculate what wide area network improvements do to our bottom-line, for example, because it's not the bottom-line dollars we're counting, it's saving the last great places that we're counting." —E.M. Cummings



Holloway Sportswear "Go Live" with Intenia

Sidney, Ohio - Holloway Sportswear and Intenia recently celebrated a successful implementation of the Enterprise Application Solution, Movex. Roy Leasure, President of Holloway Sportswear, accepted the "Go Live" award on behalf of the implementation team.

Both teams worked closely together to help achieve the key milestone in the plan to support Holloway Sportswear's strategy for the future...



Global Expansion. "Like other industries, the sporting goods industry is on the threshold of an e-commerce revolution. Smaller companies just don't have the resources to do it on their own. It pays to have an Internet-savvy partner who can get the job done and let us focus on growing the business," said Steve Jenkins, Information Systems Director for Holloway Sportswear.

Holloway Sportswear manufactures a full line of high quality sportswear for the sporting goods and promotional products markets, with items such as monogrammed and embroidered awards, corporate and letterman jackets, golf shirts, and fleece vests.

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Strategic Alliances

think about the people to whom their companies will be marketing," says Karen Berky, vice president for corporate programs for The Nature Conservancy. "Whether companies have a love of the environment or they have lands that need protecting in their communities or they simply want to appeal to the public," says Berky, "when a company like HP gets involved with a nonprofit, it wins, and, frankly, everyone wins," she says.

Hewlett-Packard's partnership with The Nature Conservancy began in the 1970s when HP first contributed its expertise to help create the Conservancy's biological and conservation database (BCD) systems—the software package at the heart of the Conservancy's land-protection efforts. Today BCD contains information on where rare plants, animals and natural communities are found, who owns those sites and how to best manage them. Information on approximately 20,000 species and 5,000

rare native habitats at 200,000 locations in North America alone is maintained using BCD. "The Conservancy was the first to do something with us on this scale," says Nancy Thomas, HP's national contributions manager. Three decades later, HP is still supporting the Conservancy—this time as it launches a groundbreaking program to identify the highest priority sites in the United States and key regions internationally—those places that must be protected to conserve natural diversity.

BARKER FINDS HIMSELF CONFRONTED ALMOST daily with a double-edged sword. The nonprofit is a second-tier adopter of technologies, buying them when the prices have come down and they're stable. Yet when it comes to directly supporting its conservation goals, the company needs leading-edge equipment.

The Eagle Has Landed

How GIS technology is saving the wilderness

Washington's Skagit River habitat is just one example of how The Nature Conservancy is harnessing the power of people and technology to protect unspoiled lands. Today the Conservancy owns 600 acres of prime eagle habitat along the river, and it works with a variety of partners, including local, state and federal agencies and other groups, to protect more than 7,000 additional acres nearby.

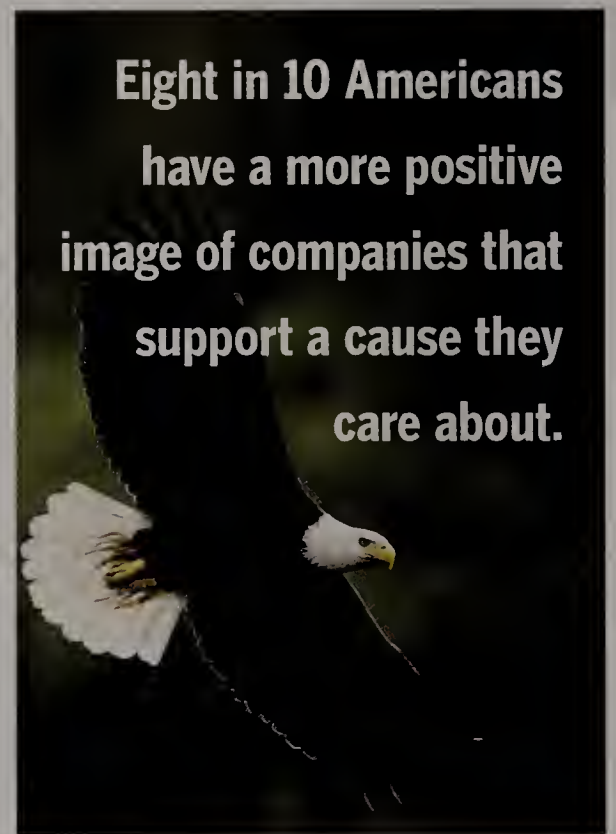
The Skagit's upper watershed area is best known for its bald eagle communities. Drawn by thousands of salmon washed up on the river's edge, the birds feed during the day and then fly to old-growth forests to roost until dawn. Working with corporate partners, the Conservancy is able to provide on-the-ground staff with the GIS technology necessary to help protect the eagles. For every eagle spotted, Conservancy workers note the time, weather, age and activity. That information, along with the exact area in which the eagle was observed, is plotted into GIS-generated maps that confirm that significant numbers of eagles are returning to the area each winter.

Corporate partnerships have been critical to the Conservancy's GIS implementation, says Frank Biasi, GIS research analyst in Durham, N.C. "GIS can be very expensive to implement," he says, "especially in an organization that is as decentralized as ours." In the United States alone, there are 85 ecoregions—areas of similar climate, vegetation and topography.

The hardware comes from a variety of sources: PCs and high-end workstations come from Dell, Hewlett-Packard and Sun Microsystems. HP recently donated 48 large-format plotters—big color printers—to provide high-quality printing capacity to every state chapter of the Conservancy, "which is the highest capital investment that any office would make in GIS," says Biasi.

In addition, Environmental Systems Research Institute in Redlands, Calif., maker of the leading GIS software, has made several outright donations, founded conservation technology support programs and signed a master purchase agreement that allows the Conservancy to acquire state-of-the-art GIS

**Eight in 10 Americans
have a more positive
image of companies that
support a cause they
care about.**



software at substantial discounts. And John Hancock has donated the use of its computer training facilities. "We're starting to roll out GIS on a widespread basis to people like geobiologists and conservation planners who are not professional GIS technicians but who want to be able to use it as another tool in their work," says Biasi. "In essence, they're donating their downtime, and what they get out of it is the knowledge that they're helping to promote conservation."

—E.M. Cummings

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Karen Berky, vice president of corporate programs for The Nature Conservancy, knows a good thing when she sees it.

THE PARTNERSHIPS, BARKER SAYS, STARTED out of that need. "When I came into the organization, I found a very underfunded IT organization that had been pushed into a corner," he says. "IT had really been managed as administrative overhead and not as a strategic enabler."

So Barker put together a plan that involved key senior management throughout the organization. He did some focus

groups and interviews and built some consensus around the priority technology initiative and investments that the company needed to make. But the price tag for IT was larger than anything anyone at the Conservancy had ever imagined. "I practically had to pick people's jaws off the table as I showed them what all that would cost," says Barker. That's when Barker understood that if the company made that money available for IT, it would come at the expense of on-the-ground conservation work. "Anything that you're spending on IT, you're not



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spending directly on your mission. You don't want to deplete the resources that go into the mission, but at the same time you can't enter the mission without investing in the tools that support it," he says. "It's a balance."

Barker had to look to other resources. One place he turned to was the IT industry—for hardware, software and expertise—and the partnership idea was born. But the idea also spawned some internal resistance, at least initially. "When you're looking at fundraising, you're going to put in front of people the best thing you've got," says Barker. "A lot of what the Conservancy does is pretty sexy—saving the planet is infused with passion and exotic places—and that's where people want to direct their dollars." So when Barker started talking about fundraising for IS, a lot of people thought, "For computers? That's not going to work." But when Barker went to the IT industry and explained how he needed their goods and services to support conserva-

The fundamentals of good partnership work regardless of the basis of the partnership. It could be anything from a marriage to a partnership between a for-profit and nonprofit, to a partnership between two for-profits. The thing that people partner with is people. "When you're looking at partnerships in the larger scheme, you're looking at sharing risks and rewards," says Barker. "But you're also looking at sharing values and vision." Here are some of the things Barker quickly learned about his partnerships:

- Bring forth a passion for what you're doing
- Be clear and sincere
- Be willing to lose any arguments that don't matter
- Heap praise on your prospective or current partner at every opportunity

The partnership can be a donation, a technology or a marketing opportunity. You might want to get your employees

“Whether it’s dealing with the environment or education, we’ve learned that when we can combine something of ours with something of yours, we can make bigger and better things happen.”

—Doug Barker

tion, people got excited. "It shows the incredible power and the direct link between what the IT industry provides and how it can really make a difference in the world," he says. "And that's something people can get excited about."

WHERE ARE THE LESSONS IN SUCH partnerships for your company? Start by trying to put yourself inside the head of the company you're interested in partnering with and think about, What do they need? and, How can we meet that need in a way that helps us too?

Think creatively, says the Conservancy's Berky. "When we walked into a meeting with Intel with 20 ideas of how we could work together, we came out with two others that we hadn't even imagined," she says. "When you understand another organization's goals and they understand yours, you often discover a new way to partner."

involved; you might want to make it your own. But you need to be sure you make a real commitment to it. "To form a good partnership, both organizations need to be committed to the common goal, whatever it is," says Intel's McManus. "You may have different reasons for wanting to achieve that goal," he says, "but you need to see it as a two-way street, listening to one another, finding common goals and looking for synergy."

Most important, when you enter into that kind of dialogue and do it openly, it's amazing the things that begin to flow out of it. "The world is your backyard, and you need to pay attention to it," adds Barker, "Whether it's dealing with the environment or education, we've learned that when we can combine something of ours with something of yours, we can make bigger and better things happen." **CIO**

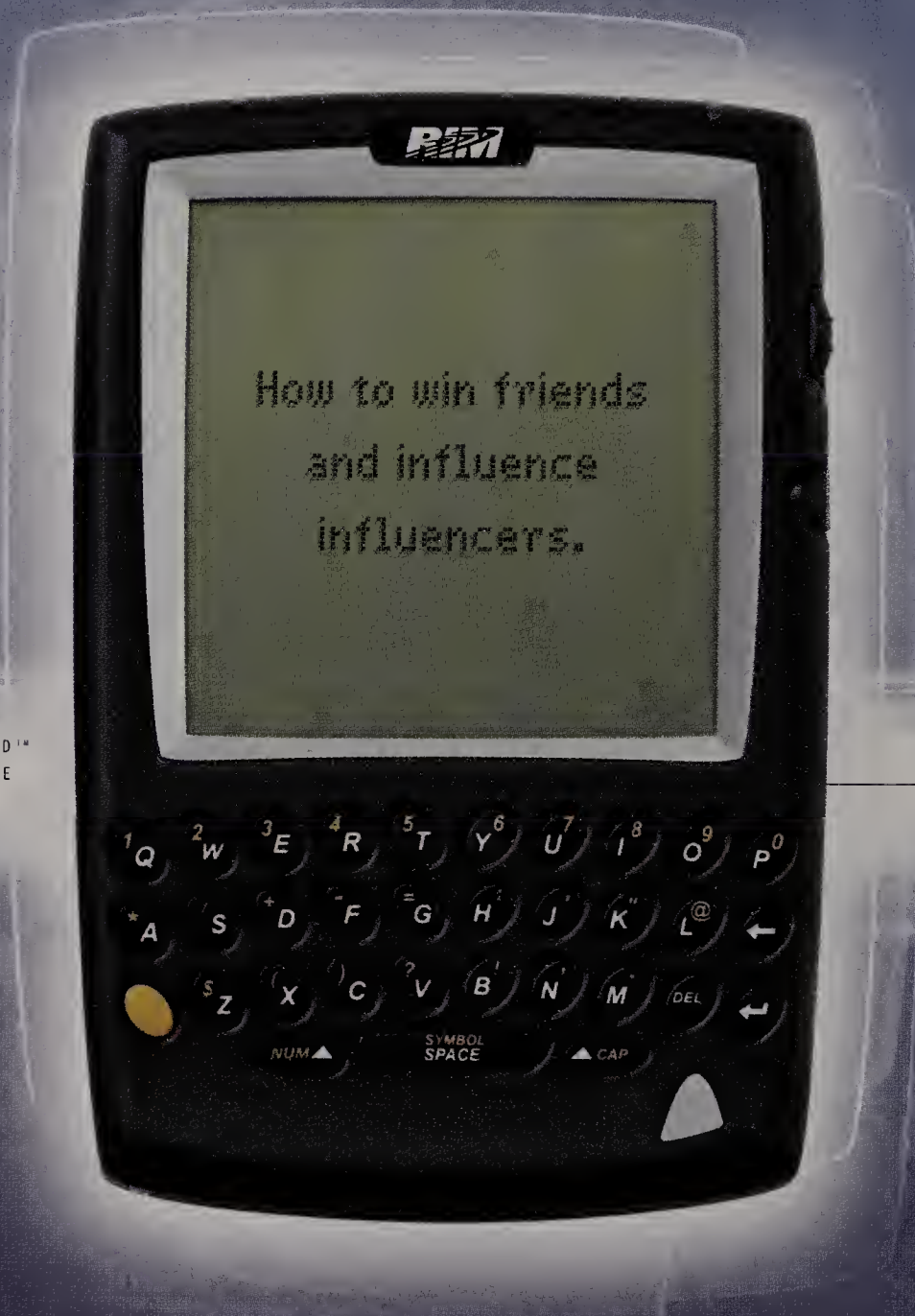
Do you have an interesting partnership model? Managing Editor Elaine M. Cummings can be reached at cummings@cio.com.

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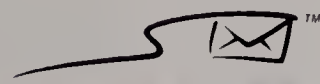
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**John Keast is both CIO
and CTO at NetworkOil,
an online exchange for
the petroleum industry.**

The Wolf at the Door

Worried about the rise of the CTO?

Well, maybe you should be. The trend represents both threat and opportunity for sitting IT executives.

Reader ROI

- ▶ Find out what's behind the CTO trend
- ▶ Learn how to recognize fundamental shifts in IT leadership needs
- ▶ Identify common organizational models for companies with both a CIO and a CTO

BY MINDY BLODGETT

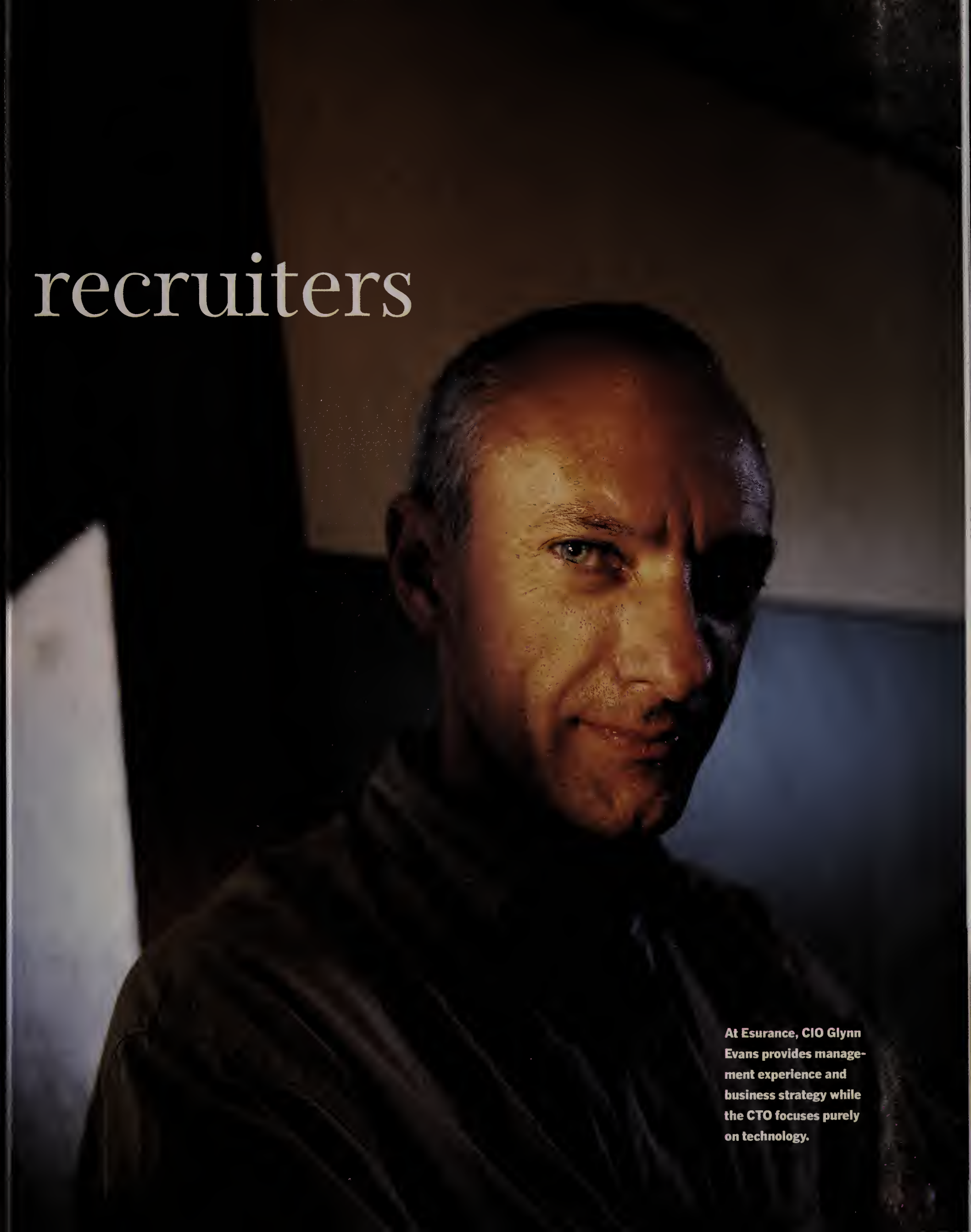
PHOTO BY MARK ROBERT HALPER

The halls of executive

and IT consultancies, not to mention the trade press, buzz with conjecture about the future of IT leadership and the momentum building up around the title of chief technology officer, or CTO. At its most dire, the rumble prophesies the demise of the CIO position—or at least its relegation to a less strategic, more internally focused supporting role. This debate over title is a bit of a red herring. The real issue is that IT leadership needs are being transformed by the dominance of e-business on corporate agendas. In fact, more often than not, CIOs themselves are being tapped to fill these newly created posts. But one thing is clear: As the demand for a new set of technology and business competencies increases, CIOs who don't develop these skills will miss out on the best jobs with the best companies—regardless of title.

PHOTO BY MARK ROBERT HALPER

recruiters



At Esurance, CIO Glynn Evans provides management experience and business strategy while the CTO focuses purely on technology.



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“The ascendancy of the points to the importance of under e-business technologies. It’s a sign CIOs who feel comfortable in their they’d better start brushing up on

CORPORATE RECRUITERS SAY THE DEMAND for CTOs is indeed growing, because chief executives think a CTO will infuse their company with much-desired e-business know-how. Yet when one examines the job descriptions for current CTO and CIO postings, they are often interchangeable. The trend seems to be strongest in the dotcom world, where the CTO title is particularly fashionable.

“Out of 15 [executive job searches] I am currently conducting, 14 are for CTOs and one is for a CIO,” says Phillip Schneidermeyer, technology officers practice leader at the executive recruiting company Korn/Ferry International. The majority of these jobs are at startups and dotcoms, he says, but it reflects the demand in the market. “It all started about a year and a half ago, when the rest of corporate America realized that the Amazon.com phenomenon was real and that the web had to be dealt with. Many CEOs just don’t think that the CIO can handle it all—and so they are seeking CTOs to round out the IT leadership. What this says is that CIOs need to

roll up their sleeves and start getting that internet experience.”

Does this mean the end of an era for CIOs? Far from it. “A lot of this is just nomenclature,” says Richard Brennen, managing director of the information technology practice at Spencer Stuart in Chicago. “A lot of new age companies are using the term CTO when they really mean CIO. There is a lot of panic among the CEOs; they’re coming to recruiters and saying, ‘Get me one of those [CTOs].’ But when you ask them why, they haven’t thought it out, and they don’t know where they want to go with it. There is a lot of blurring of the roles.”

This trend is being fueled from the supply side as well. The CTO job title has attained such a glossy sheen that many IT leader candidates—especially young people—are seeking it, even if the duties laid out in the job search include many classic CIO duties. “It’s just seen as a sexier title,” says Brennen. “It’s very buzzy and attractive, especially to young people. It says, I know technology.”

At the heart of the matter for CIOs is the threat that they will be supplanted by new web-savvy colleagues grabbing control of pivotal internet agendas and strategies. Yet there is opportunity here as

CTO role standing for even those jobs that the internet.”

—JOHN PUCKETT, CIO, TOYSMART.COM

well. CIOs can decide that they want to lead the internet stampede at their companies: Taking that bull by the horns, they can deflect worried CEOs from knee-jerk copycatting when they queasily read about competitors hiring CTOs. Or CIOs can decide they want to delegate the internet stampede but direct it by working closely with their CEOs to reshape the company's IT leadership structure. In any event, it's an excellent time for CIOs to do some serious career soul-searching and examine both the needs of their companies and their own skills, especially regarding the internet and systems that interact with the customer.

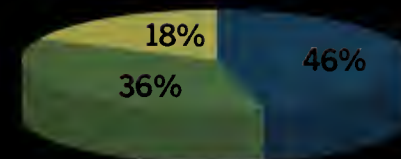
“The world is changing,” says Debra C. Robinson, CIO of CVS.com, the Seattle-based spinoff of CVS Corp. She works closely with the CTO of CVS.com, as well as with the CIO of CVS Corp., ensuring integration between the two entities. “I know some CIOs who fear being replaced by CTOs. But the point is that you have to become more customer-centric—more externally focused—no matter what your title is, or else you will be pushed to the back office.”

E Pluribus Plurum

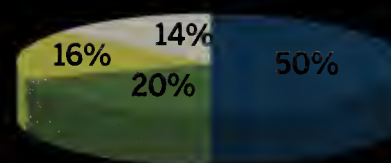
Survey shows little consensus in specifics of CIO and CTO roles

■ CIO only ■ CTO only ■ Both CIO and CTO ■ Other

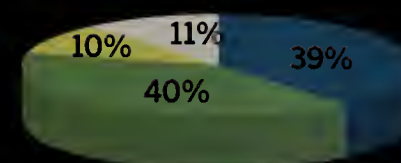
What IT officers does your company have?



Who sits on the executive committee?



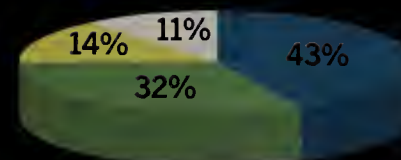
Who investigates, analyzes and introduces new technology?



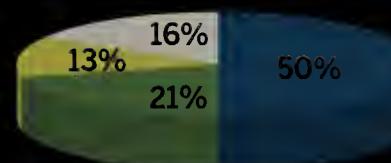
Who is responsible for the technology touching internal users?



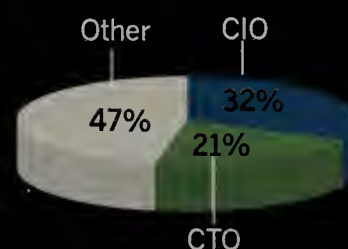
Who is responsible for the technology touching external customers?



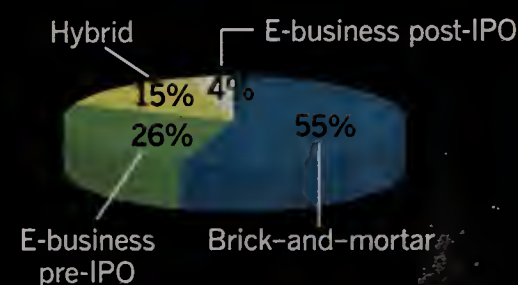
Who has primary control over the budget for technology investments across the enterprise?



Respondent Composition



Type of Company



SOURCE: CIO.COM BASED ON 179 RESPONSES.

THERE HAVE BEEN TWO TRADITIONAL models for CTOs in the past. At companies whose products are technology-based—whether that be information technology, pharmaceutical technology or electronics or appliance technology—the CTO usually heads up new-product development. A second model arose five or six years ago, as CIOs in all industries focused more of their attention on strategic issues and business goals and needed someone to bird-dog emerging technologies that might serve those goals. (For an earlier look at the rise of the CTO, see “The New Role Models,” *CIO*, May 15, 1995, or visit www.cio.com/printlinks.)

What’s happening today represents a blurring of these two roles with that of the CIO. As more companies are increasingly information driven and technology enabled, the “product” blends with the operations of the organization. Is Amazon.com a bookseller over the web or a technology vehicle? As a consequence, “CEOs are look-

ing for a technology visionary and strategist who can think not just in terms of the implementation of technology but also in terms of where technology will be in the future—and how it impacts the core of the company,” says Tony Ibarguen, president of professional services and managing director of the Internet Capital Group in Wayne, Pa.

CIOs—at least those who really live up to the title—have a good part of the equation. The rising popularity of the CTO title points out where they may be falling short.

“The ascendancy of the CTO role points to the importance of understanding e-business technologies,” says John Puckett, former CIO at GTE Internetworking and now CIO at Toysmart.com in Waltham, Mass. “It’s a sign for even those CIOs who feel comfortable in their jobs that they’d better start brushing up on the internet. Many of them aren’t—and they will be left out in the cold for new jobs, be they CTO or CIO.”

While there are no clear-cut divisions between roles as yet, Brennen of Spencer Stuart says that many companies now recruiting CIOs are searching for someone who is more of a business executive, more of a resource manager, whether of internal resources or externally outsourced operations. The CTO, on the other hand, is typically more web-centric and closer to the technology than the typical CIO. In the end, title choice depends on the industry, size and business goals of the company—and its personal preference. In terms of leadership structures, variations are abundant, but a few basic models stand out.

At Kraft, both CIO Steve Finnerty (left) and CTO Mansour Zadeh (right) are becoming more externally focused.



ONE MODEL THAT’S developing, especially in larger companies, is to split IT leadership between a CIO and a CTO. Although many CIOs have worked with CTOs in the past, today’s CTOs are being given more responsibility because of the overwhelming demands and complexities of leaping into the e-business fray. In many of these cases, the CTO reports to the CIO.

At Northfield, Ill.-based Kraft Foods, the growth of e-business has led to a duopoly in which the CIO and CTO work closely together with some blurring of responsibilities, according to Jim Kinney, former CIO (now retired). Kinney hired Steve Finnerty two years ago as CTO. At that time, Kinney was already well into succession planning, and he saw Finnerty as a good potential replacement. Finnerty has now succeeded Kinney, and Mansour Zadeh is the new CTO.

In the Kraft model, the CTO reports to the CIO, who is a member of the operating committee.

PHOTO BY GREG GILLIS

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The one about the tasteless joke some clown thought was funny. It wound up in an e-mail box that resulted in a \$2.2 million sexual harassment lawsuit.

The fact is, last year the Supreme Court ruled companies are liable and responsible for inappropriate e-mail communications between employees, regardless of whether or not the company was aware of the communication.

Beyond just exposing you to liability, an employee who inadvertently e-mails confidential proprietary information exposes you to the loss of corporate trade secrets or strategic documents.

And improper use of e-mail privileges can actually crash a server and cost a corporation

CONTENT SECURITY. THE GOOD, THE BAD, AND THE UGLY.



hundreds of thousands of dollars. Such was the case when an employee sent 60,000 co-workers an e-mail with return-receipts requested.

By scanning and monitoring Internet usage and e-mail activities, you can limit liability and confidential information leaks, reduce e-mail volume and exposure to suspicious content, while also boosting bandwidth.

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making 15-year-olds writing malicious code viruses. Simply joyrides at others' expense.

On the other hand, there are real ugly enemies out there.

Rogue employees and virtual terrorists bent on stealing company secrets, spreading malicious viruses, crashing servers, and potentially causing economic chaos.

These kinds of attacks are formidable and very costly.

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many security guards or surveillance cameras you have, they can electronically paralyze your site, perform industrial terrorism, and even hold your business for ransom.

Your best defense against these unseen enemies is a Content Security policy.

WHO KNOWS WHAT EVIL LURKS IN THE OFFICE NEXT DOOR?

It used to be that IT managers just had to worry about people who didn't know how to use computers.

Now they have to worry about people who do.

Take the guy down the hall who looks like he's working while he downloads inappropriate content or trades stocks, follows auctions, shops, posts resumes, surfs for hours, or catches the streaming videos of sports highlights.

Not a bad guy, most likely a good employee who is an unwitting threat to your organization.

For as he's accessing inappropriate sites, he's also unintentionally exposing the entire enterprise to malicious code and potential liabilities.

Not to mention being a severe drain on a company's productivity and resources.

Of course, with all of these kinds of people on the Internet at once, doing things they're not supposed to do, it not only slows down work, it clogs and chokes bandwidth.

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“I look at how technology will help get us attention and draw in customers. It’s very different from the classic CIO role.”

—SCOTT DINSDALE, CTO, FIRSTLOOK.COM

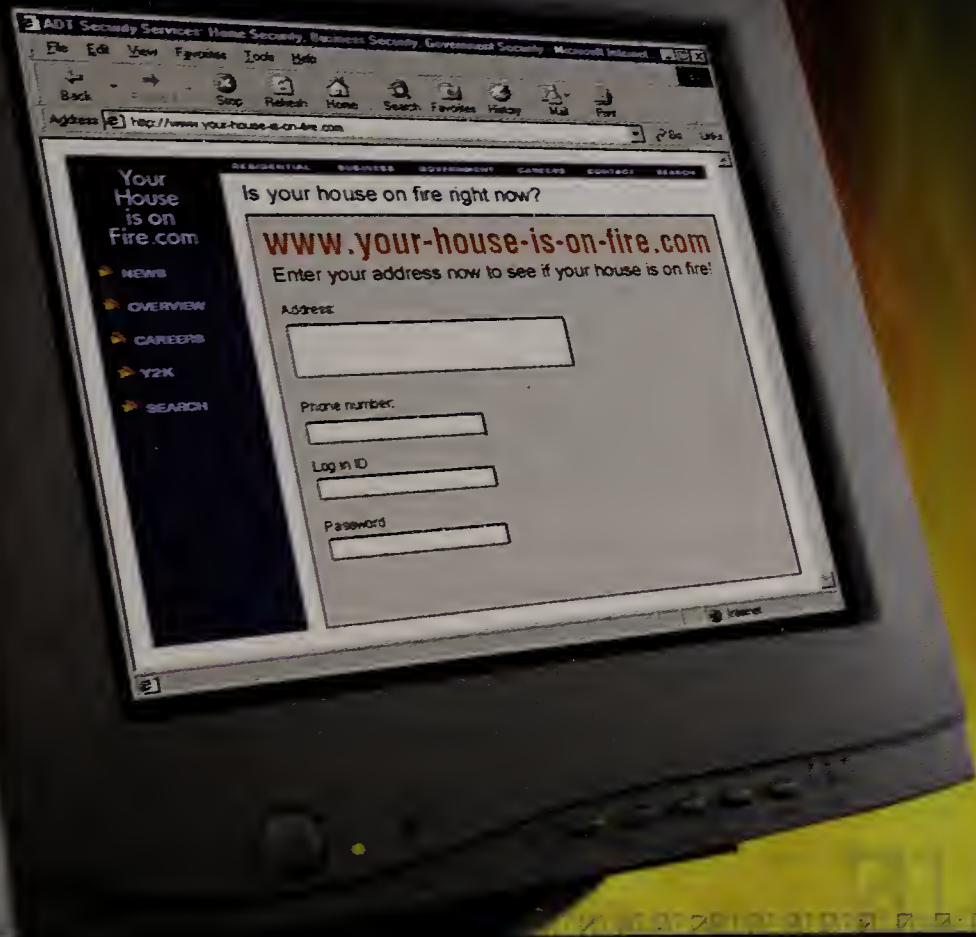
“Both Steve and I began to spend much more of our time looking out externally from the company—for different reasons, but the driver was e-commerce in both cases,” Kinney says. Kinney increasingly focused on building relationships outside of Kraft but within the food industry, such as searching out consortiums for supply chain management and seeking partnerships with other food industry companies. Meanwhile, Finnerty spent a good deal of his time meeting with infrastructure and technology providers to form strategies for

external connections with customers and suppliers. This model will continue with Finnerty in charge and Zadeh as CTO.

“The point is that these jobs are too big for one person,” Kinney says. “There is no way a CIO can do it all today and still be able to move his or her company into e-commerce.”

The growing importance of the CTO at Kraft is evidenced by Zadeh’s responsibility for globalization of the technology infrastructure, which will allow Kraft employees worldwide to share applica-

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“The difference, no matter what your title, is the new emphasis on being driven by external customers.”

—JOHN KEAST, CIO AND CTO AT NETWORKOIL

tions and collaborate. Just a couple of years ago such a strategy would have been the sole responsibility of the CIO, Finnerty says.

As CIO, Finnerty retains oversight of the strategic aspects of technology planning. “If there needs to be a discussion with our CEO about service levels and how things are running, I have no trouble with the CEO having that discussion directly with the CTO,” he says. “But if we need to have a discussion about possible strategies driven by technology—that is something we would do in tandem, after reaching an agreement together and then going to the CEO.”

Such CIO-CTO partnerships exist in the dotcom world as well. At Esurance, an online insurance company based in San Francisco, CIO Glynn Evans sees himself as a business evangelist who works closely with the CTO, one of the first employees hired at the growing company. Evans, formerly the CIO at Reuters International, was brought in to lend his seasoned management experience to the fledgling operation. Evans oversees the call center and other operational infrastructure, but he also does marketing. “I am the one who handles external communications, who meets with clients, who tries to sell people on the business, who is more the business strategist. I demystify the technology for the business users in the company. [Huyen Bui], the CTO, is a very bright guy who focuses completely on technology, probing it. We work in tandem.”

Evans thinks focusing on titles is silly. But he acknowledges that he is “the kind of CIO that’s comfortable with speed and with the lack of hierarchical organizational charts. There’s lots of room and opportunity for CIOs like that now. But I do think it is difficult to do [the whole] job today—you do need both CIO and CTO roles.”

SMALLER, NEWER DOTCOMS SEEM TO BE THE exception to that rule—as long as they stay small enough for one person to be able to manage all of IT. Once these companies grow to thousands of employees and a billion dollars in revenues, it’s unlikely the solo structure will remain. The reason many of these companies are choosing the CTO title is because for them technology is the business; if the IT leader doesn’t know the new technologies, the business will simply grind to a halt. Still, many are sticking with the CIO title—witness Barnesandnoble.com, eBay, Toysmart and even Amazon.com.

So who are these new technology executives? As often as not, they were CIOs in a former life. Scott Dinsdale, the CTO at FirstLook.com, a music sampling site, formerly held the title of both CIO and CTO at BMG Entertainment. In his new role, Dinsdale focuses on new technologies. Because his company is so small and new, he also performs more traditional IT duties, such as setting up the network and e-mail accounts. When he jumped over to the realm of internet startups, he said the title of CTO just made more sense. “Technology has a tremendous impact on our business,” Dinsdale says. “My definition of CTO is of a role that is externally focused, looking at the future. I do marketing, I look at how technology will help get us attention and draw in customers. It’s very different from the classic CIO role.”

Like Dinsdale when he was at BMG, some IT leaders avoid the whole title debate—and the pigeonholing it implies—by taking on both titles. John Keast, former CIO of Pacific Gas and Electric, became both CIO and CTO at Branders.com, a website that sells pro-



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motional products. When he made the switch to a dotcom, he wanted the two titles to lay out the totality of the landscape. "I can't really identify a significant skill set [difference] between the two roles...some of this conflict is just semantics." According to Keast, a good CIO or CTO should be able to do it all. The difference today, regardless of title, is the new emphasis on external customers. Keast has recently become the CIO and CTO at NetworkOil, a Houston-based internet marketplace for trading petroleum equipment and services.

THE BUZZ ABOUT TITLES MAY SEEM like the wolf at the door, but that's just the decoy. The real danger is in overlooking the root changes in business that bring these permutations and opportunities to the CIO's career path. CIOs need to continue to show business leaders that they understand the busi-

ness enough to know where the technology is relevant and necessary, advises Rajan Srikanth, director of Delta Consulting Group in San Francisco. This includes working closely with the CTO and, if possible, being in on the hiring.

"With that credibility, you can say, 'I can't do this all myself, I need to bring in the best in the business,'" Srikanth says. "Then make sure that person has a high profile in the organization. If the CTO is marginalized and therefore fails, you will be blamed anyway." Despite lurking anxiety about diluting the CIO position, this kind of action will increase your strength with the executive team, not lessen it. "You want to be able to say, I took the lead here, and I had an impact; I am doing more than putting in an ERP system."

Judy Shapiro, the CIO of Bowne and Co., a New York City-based financial industry printer, did just that. She was hired to replace a CIO who primarily focused on the operational, back-office functions of the job. The company was sailing on a distinctly e-business tack, and Shapiro decided that for her to be able to focus on the business strategy and strategic alliances, the company also needed "someone who could worry about the integration of the technology across the business units," she says. "We needed to build up our technical abilities tremendously." She and the CTO bring complementary skills, and "we have a mutual respect and shared vision."

So who's afraid of the CTO? Only CIOs who don't grasp that business is changing, the web is here to stay and agility is as important as (99.999 percent) reliability. Maybe one of the IT leadership models outlined in this article will suit you, or maybe you'll have to devise a whole new scenario. But if the job is getting too big for one person, be the person who figures that out and finds a solution, whether you want to be called CIO, CTO or Czar of IT. "The worst thing you can do," says Spencer Stuart's Brennen, "is sit back and hope the whole thing goes by you." **CIO**

Senior Writer Mindy Blodgett is interested in how CIOs are faring in the shifting e-business landscape. Send your thoughts to mblodgett@cio.com.

Judy Shapiro, CIO of Bowne and Co., handles strategy and alliances; the CTO integrates technology.



PHOTO BY JOHN RAE

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iWant's marketplace lets consumers dictate their needs online and gives sellers direct access to potential customers

BY EMELIE RUTHERFORD

Command Performance

The Company: iWant.com

Founded February 1999 **Website Launched** September 1999 **Location** Burlington, Mass. **Leadership** Shabbir Dahod, president and CEO **Employees** 28 **Mission** To facilitate one-on-one communication between buyers and qualified sellers **Progress as of late March 2000** 105,000 buyers and sellers registered; approximately 85,000 wants listed; connected more than 83,000 buyers to sellers **Funding** \$10 million in venture capital **URL** www.iwant.com

ON A COLD FEBRUARY MORNING in 1999, Shabbir Dahod was searching for something that eludes the CEOs of many web startups: a short, unique and memorable name that signifies the purpose of his website. He and his newly formed, three-member management team sat around a conference table, shouting out words that could serve as the name brand of their forthcoming business-to-consumer e-commerce site. The site, which Dahod had been planning for months, would be an online marketplace in which consumers would request products and services, and businesses and individuals would browse through and reply to requests.

Dahod knew he had a good idea, the right combination of talent (he and his management team had been developing software and internet-related technologies since the early 1980s) and investor interest to introduce the site to the world and start building a critical mass of users. But he couldn't do anything until he and his cohorts emerged from the conference room with a name. "It wasn't until Peter [Spellman, the company's CTO] said, 'When a little kid really wants something, he raises his hand and says I want,'" recalls Dahod. "'Well,' Peter said, 'that's what we're doing, in its most basic form: telling people to state on the internet exactly what they want.'" Hence, the venture was christened iWant. "We identified [the new site's] core essence in a name," Dahod says.

Dahod dreamed up the idea for iWant with Spellman in 1998 when both were working for Microsoft. The two decided to leave Seattle and relocate to the Boston area, where Dahod grew up, to start their own web company. They set up shop in January 1999 at the Waltham, Mass.-based facility of Matrix Partners, iWant's incubator and initial funder.

Things have gone well for Dahod, Spellman and the rest of the founding team since their name-defining meeting last year. After buying the domain name www.iwant.com from a squat-



**CTO Peter Spellman (left)
and CEO Shabbir Dahod
left Microsoft to launch
their own startup.**

ter for a sizable amount of money and adding a few more seasoned veterans to their core management team, they started building the site and its user base. With \$3 million in financing from Matrix, iWant moved from the incubator facility into swanky new digs in Burlington, Mass., in May 1999. Launched in September 1999, the iWant website saw 10,000 users log on in the first week. By mid-October the site had 25,000 registered users. In March 2000, iWant secured \$7 million in a second round of funding from Matrix and Westport, Conn.-based Pequot Capital Man-

agement and introduced a redesign of its site. The new site streamlines the process by which buyers list wants and sellers search listings, reducing the number of pages each has to visit before adding and retrieving data.

Relationship Building

Communication between buyers and sellers is at the heart of iWant.com. The rapport begins when a buyer visits the site with a preconceived idea of the product he desires. He creates and posts a listing for a "want," (which can be as diverse as vintage posters,

vacation rentals or a house), sets up a mailbox and waits for appropriate sellers to contact him. The sellers—individuals and small business reps—have to respond to the buyer's direct requests before completing the sale. The buyer may not initiate correspondence until he hears from a seller who has what he wants—whether it's babysitting services from a local sitter with references, a modern apartment on a quiet street or tickets for a cruise that caters to young people.

People selling their goods can be selective about potential buyers, and small business

owners can develop long-term relationships. "For most of these businesses, getting a customer is extremely valuable because this opens up a whole new network of customers they can go mine," Dahod explains. Sellers that contact more than 10 buyers a month have to pay iWant a subscription fee of \$9.95 a month; when a customer buys a product on the site, iWant collects a fee from the seller worth 1 to 2 percent of the transaction, up to a maximum of \$75.

Candi Catanise, the chairwoman of Hear & There, a nonprofit travel service for the deaf and hard of hearing in Rochester, N.Y., stumbled across iWant. Although she was in need of buyers, she took the reverse approach of many sellers and placed a want, requesting people interested in traveling to Italy with a group. Within days, she received several responses, arranged two group trips and began browsing iWant's travel listings on a weekly basis for others seeking European adventures. "It's great to look at your prospective clients on the site and compare them," says Catanise. That's something she isn't able to do when matching vacationers for group travel over the phone.

Dahod is proud of the personal interactions iWant facilitates and says there's no other company doing what it's doing. Other sites that allow buyers to control sales interactions focus on price and product, not on the communication between buyer and seller, Dahod points out. Mercata, for example, provides group buying discounts, Priceline.com allows consumers to name their price, eBay facilitates auctions, Egghead.com sites sell clearance items and Buyersedge.com enables merchants to bid for customers' business.

While iWant isn't profitable yet (the company's revenue comes from the subscription and transaction fees instituted in February and from advertising on the site), Dahod feels the emphasis on buyer-seller communication is enough to propel the company into the black. He's convinced consumers want to build a relationship when making involved, personal purchases, such as buying a new car or planning a week-long vaca-

tion. Unlike eBay, which prevails because it removes the middleman from the purchasing process, the majority of current iWant-enabled sales are travel packages that cannot be purchased easily through an automated, anonymous process.

EXPERT ANALYSIS BY JOHN M. JORDAN

The Market Is the Message

As a startup, iWant's success factors include traits shared by most good online businesses—a quality management team, relentless focus on core functionality and creative alliances.

iWant allows small businesses to respond to customer-initiated transactions. This collaborative, iterative process of description and response allows commerce to proceed in ways that would be economically unfeasible by phone, fax or mail. Such a dynamic is in keeping with the behavior of scale on the internet: Very large players can do new kinds of mass production and distribution, while niche players can be highly effective at meeting complex needs within small pools of demand.

What's useful about iWant is the degree to which buyers can articulate exactly what they value and, by implication, the price they will pay. iWant's business model parallels those of eBay, MetalSite, Gofish.com and many others: It's better to be the market where buyers and sellers meet than to make stuff or sell services. Being the market relieves iWant from pricing the offer (the market does that) and fulfillment—two very difficult tasks. Marketplaces also have the opportunity to capture network effects. Having more buyers means more sellers pay attention, and more sellers increase the odds of a buyer's request finding its exact provider, which should pull more buyers into the loop.

iWant is not home free. In an open economic system, switching costs tend to be very low; a customer doesn't have to rip out onsite equipment or install new proprietary software to change vendors. The challenge is to create perceptual switching costs so that customers served sufficiently well won't make the effort to find a new provider. To some extent, iWant is at the mercy of its network. Poor customer turnout or sloppy seller execution can start an exodus—particularly if a powerfully branded online competitor challenges the startup. The trick will be to learn how to nurture and seed the buyer and seller sides of the equation with techniques not well understood in traditional theories of management. After all, nodes in a network are not the same as boxes on an organizational chart or customers in a market. iWant seems adept at learning on the fly, however, which is a key requirement for success in any online venture.



John M. Jordan is the director of electronic commerce research at the Ernst & Young Center for Business Innovation in Cambridge, Mass. He can be reached at John.Jordan@ey.com.

Sellers in the Middle

While iWant includes the inevitable collectibles categories, Dahod feels its most valuable interactions occur in travel and the similarly assistance-heavy realms of electronics, vehicles and real estate. Thus, iWant's middlemen—the

look beyond the horizon



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building  futures

small travel agents, pet store owners and software sellers using the site—help people make purchases they would otherwise not make online because they want personalized advice and guidance. “Some purchases made online can’t end with first discussion or first contact,” says Dahod. “The universe of things special to you, like a B&B in Italy, a new pet or a special system for a nongeneric computer, need more attention.”

Dahod has gone to great lengths to ensure that iWant has the middlemen sellers that will give its buyers such attention. While iWant welcomes any sellers to browse the site and respond to the wants listed, many sellers are small businesses connected with affinity organizations that have agreements with iWant. These organizations, such as First USA Affinity Partners, are umbrella organizations for smaller, focused affinity groups such as the American Boating Association and World Travelers of America. Recognizing these affinity organizations as easy avenues to groups of small businesses without established presence on the web, Dahod’s crew has cultivated relationships with them since the site’s inception. iWant reaches these small businesses by inserting brochures into the affinity organizations’ mailings, informing business owners and reps that they can find interested buyers on the web via iWant. The World Travelers agreement alone allows iWant direct access to more than 50,000 small car rental companies. In March, iWant inked deals with Smarter Living, a travel site with hundreds of thousands of members, and with Cruise Lines International Association, which has 100,000 affiliated travel agents.

Dahod attributes much of iWant’s early success to the incubation at Matrix where he and his team were in constant contact with investors. “It was fertile ground for networking,” says Dahod, who also met iWant’s second investor, Pequot, during the time at Matrix. “When other companies came in and gave presentations, [the Matrix people] would grab us and bring us right in the meeting. We were in a hub of startup activity.”

Dahod also found most of his core management team while at Matrix. From the

iWant’s model encompasses several online commerce trends.

Trend one Demand drives the model. Suppliers don’t push goods through a distribution model. Instead, customers initiate a transaction with descriptions of what they want. Small businesses are well situated to respond to such queries insofar as the customers may require high personalization and creativity in solving their problems.

Trend two Price is not the key motivation for buyers. The “rightness” of fit matters more in many transactions. One buyer may prize precision delivery, another fit and finish, a third, ease of integration with existing paperwork and process.

Trend three Create a market in which buyers and sellers meet. Operating in territory formerly occupied by closed institutions such as The Chicago Board of Trade or Nasdaq, these online businesses combine the internet’s powerful, open infrastructure with a good idea, a traffic-generating strategy (alliances in the case of iWant) and an attractive pricing scheme designed to generate transaction volume rather than cover some real or imagined cost structure.

SOURCE: JOHN M. JORDAN, ERNST & YOUNG

start, iWant signed up seasoned veterans who came from large and small companies alike, many with at least one garage-type startup experience under their belts. “People who go through a startup process for the first time may run faster in motion but don’t get traction as quickly,” Dahod says.

Looking Ahead

iWant has kicked off a consumer marketing campaign this spring and is working on more than 10 partnerships with web portals and regional sites. The first such agreement, announced in February, is with Boston.com, a Boston area portal. Dahod hopes that such partnerships will increase iWant’s already robust buyer base, while marketing campaigns, including television ads and radio spots, will make the brand more visible.

Eventually, Dahod believes iWant will turn the tables on traditional commerce. “We’re letting the consumers come and state exactly what it is that they want, and state it in their own words,” he explains. “iWant.com allows them to actually command the commerce, from their perspective.”

And consumers are commanding this commerce not only from small business

owners, but also from other people like themselves. Stacey Cole found iWant by chance, after placing listings on every online classified site she knew without success. When she saw a banner on one of these sites advertising iWant, she ventured to it and placed a listing, expecting nothing. And Cole’s want was very personal to her. She wanted a red and white husky to replace her dog that died. “Within the hour I had e-mails from everywhere,” she recalls. “I picked the one that best described the dog I wanted, replied to it and picked up two dogs within the week.” Cole feels iWant’s best attributes are its ease of use and hefty user base.

Many web companies have been trying to figure out how to unlock the potential of small businesses on the internet, with endless service providers aiding their transition into e-businesses. iWant, conversely, is not trying to transform businesses into anything, but instead is aiming to enable them to take advantage of the internet. “Because if you ask a small business owner, it’s not the website they want; it’s the customer,” says Dahod. **CIO**

Web Writer Emelie Rutherford wants reader feedback. Reply to her at erutherford@cio.com.



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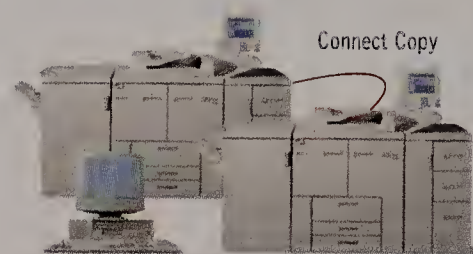
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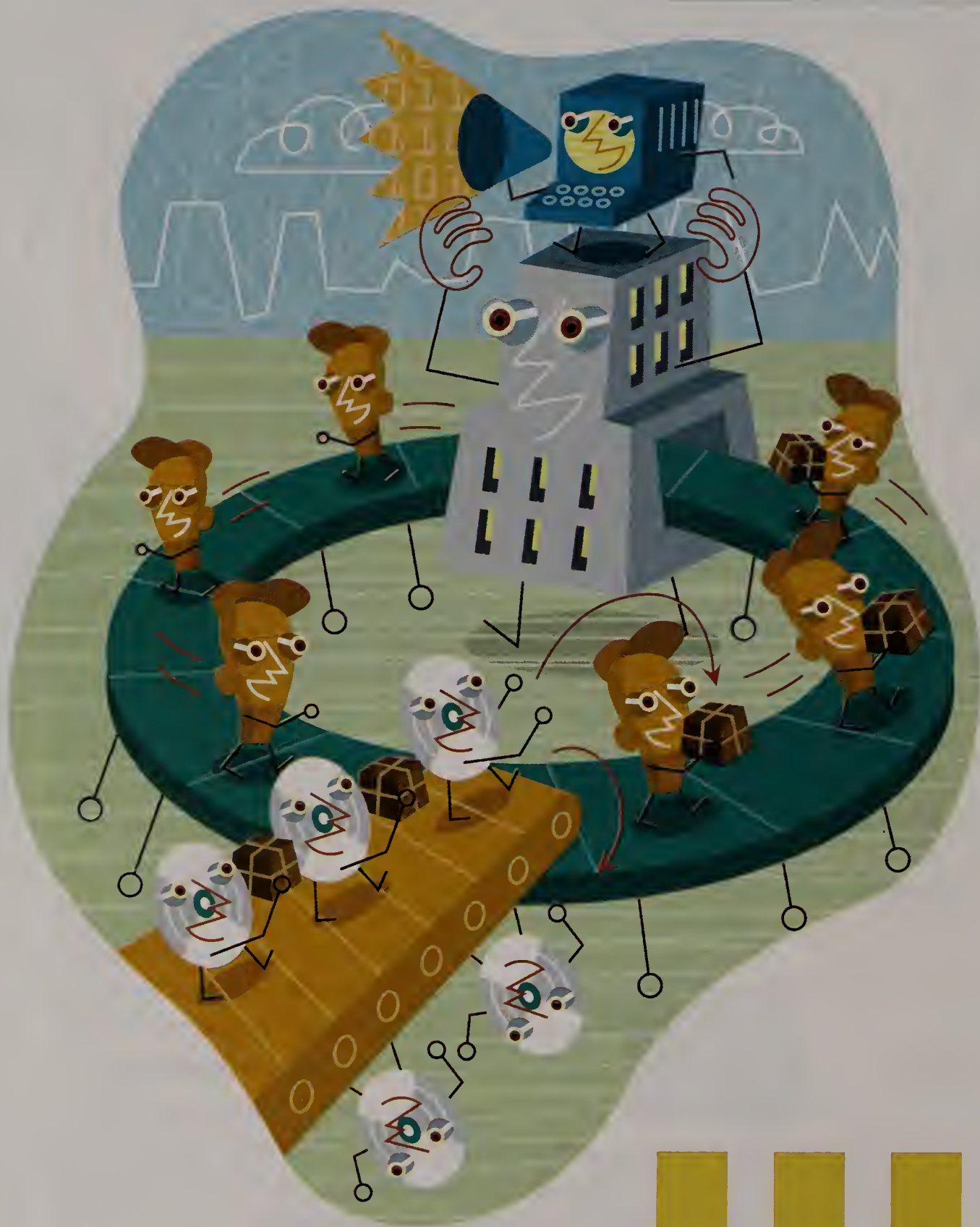
The Integrated Enterprise



“E-business” will soon drop its prefix, because there won’t be any other kind of business. The flow of products and services will be intertwined inextricably with the flow of electronic information. And the rocky path that leads from today’s commerce to that future state has a name: Integration. The three articles in this package kick off an exploration of integration issues that we will continue throughout the year.

The Whole Is More Than Its Parts (Page 116) addresses the need for a holistic plan in place of piecemeal integration efforts; **Middleware Demystified** (Page 126) offers a primer on the ever-evolving middleware technology arena; and **Human Error** (Page 136) provides tips for making sure personnel are ready to share information when technology makes it possible. We hope you find them useful.

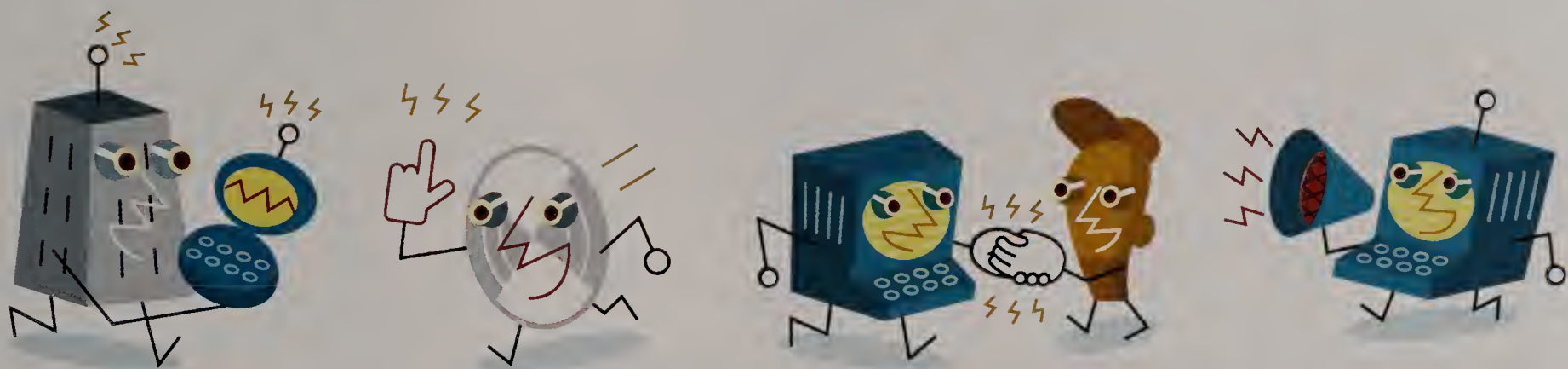
The whole...



Getting to the truly integrated enterprise should not be a piecemeal journey. You've got to have a vision of where you're going in order to get there.

BY DEREK SLATER

is more



Integration and information go hand in hand. More than ever before, customers are demanding information—about their accounts, their balances, their recent purchases and deposits, their bills, their products—from every branch of your company. They want it over the phone, over the internet or with the help of EDI or XML, and they want it now. Getting that information means accessing data from various systems, and on the CIO's to-do list that means integration. And so CIOs set out to integrate with all due haste; they use Cobol and legacy access tools, they sprinkle in screen scrapers and middleware, and they get the job done.

Reader ROI

Read this special report to learn

- ▶ Why big companies need a big-picture approach to integration (this article)
- ▶ The basic concepts, terms and types of middleware (in *Middleware Demystified*, Page 126)
- ▶ Strategies for getting employees in the data-sharing spirit (in *Human Error*, Page 136)

Unfortunately, cobbling systems together isn't enough. The question for CIOs to ask themselves isn't, "Are we integrating our systems?" That answer is yes for every company that hasn't yet been Delled or Amazoned out of existence.

The right question now is, "Can we get information from anywhere in our company to anywhere in our value chain?" The answer to that question is mostly a resounding no, and the vision for getting there—for becoming a truly integrated enterprise—is the real responsibility that CIOs must take on before writing another API or buying another web/host integration package.

The vision for your integrated enterprise has to incorporate your company's infrastructure and logical connectivity to move data from application to application at speeds and volumes that will eventually dwarf today's requirements. Further, that vision has to make handling future integration needs easier, whether they arise from adding new e-commerce applications or from unforeseen mergers and acquisitions.

Any data, from anywhere to anywhere in the value chain, at any time: It's a tall order, but customer demands and competition from the dotcom world will push you to it. If you don't deliver, customers will eventually look elsewhere.

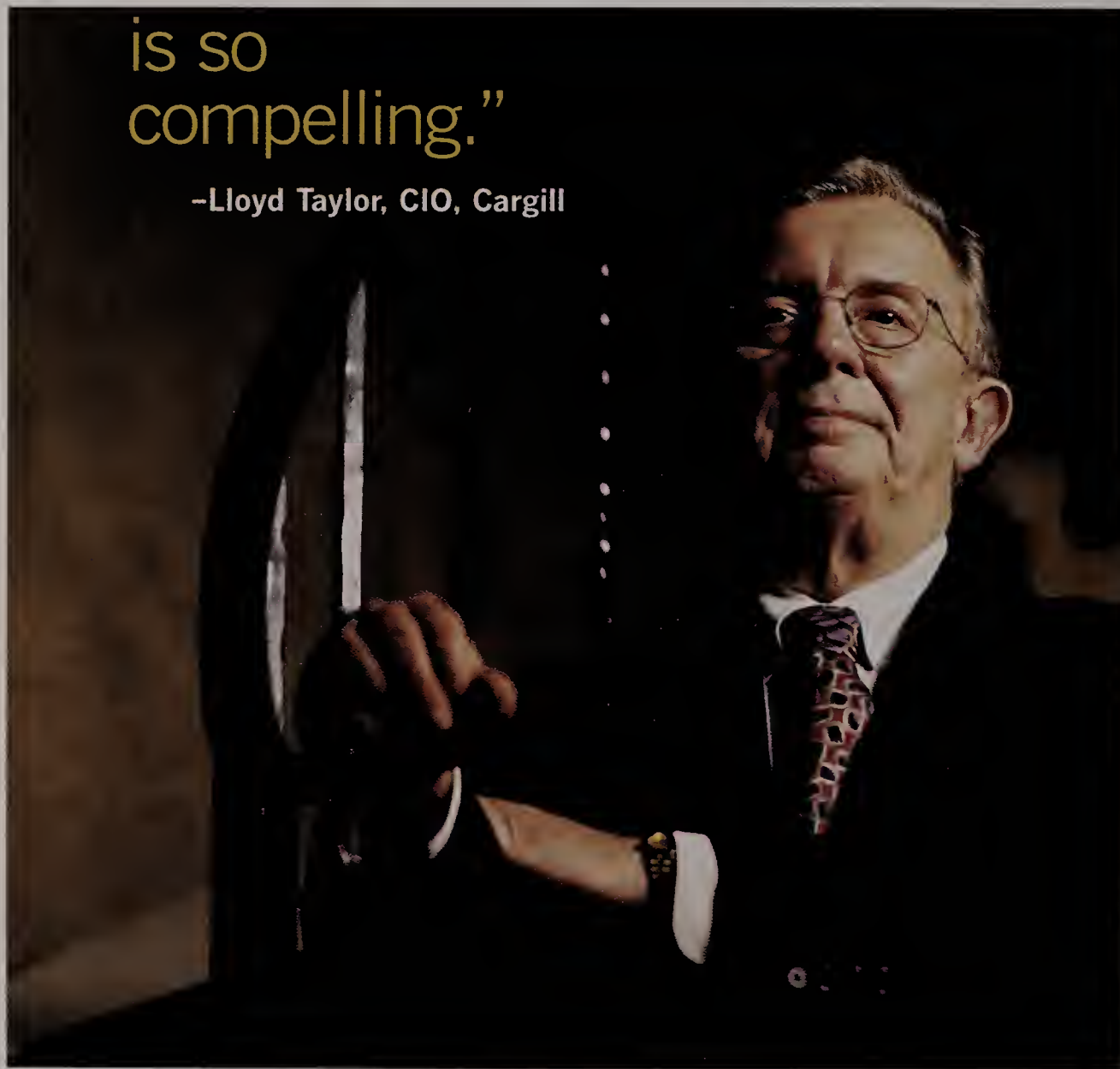
THE PAYOFF

The integrated enterprise: Delusional fantasy? Shimmering mirage in the blistering heat of the internet economy? Not on your life. True, the standards aren't all settled yet for interbusiness communication, nor are the technologies mature. And organizational inertia is also an obstacle. "Large companies are structurally built to prevent [this degree of] integration," says Marc Cecere, a vice president at Giga Group in Cambridge, Mass. But it is clearly the direction in which today's businesses must go. The current practice of business is increasingly networked and interconnected. The benefits are numerous, and at the same time the retribution for those who fail to move with the current will likely be swift.

than its parts

“The value of a well-thought-out architecture is so compelling.”

—Lloyd Taylor, CIO, Cargill



costs for integrating additional applications [throughout other Cargill units] started going down incrementally,” says Taylor. As a result, the engine cut Cargill’s integration costs from 50 percent to 85 percent on subsequent projects, he says.

But the potential benefits run deeper than

tionships for a long time to come. “I would like to be ordained by my customer as the partner of choice, and the worst possible place to do that is at the point of purchase,” says Stan Elbaum, a partner at Benchmarking Partners. “I want to become part of their decision-making process.”

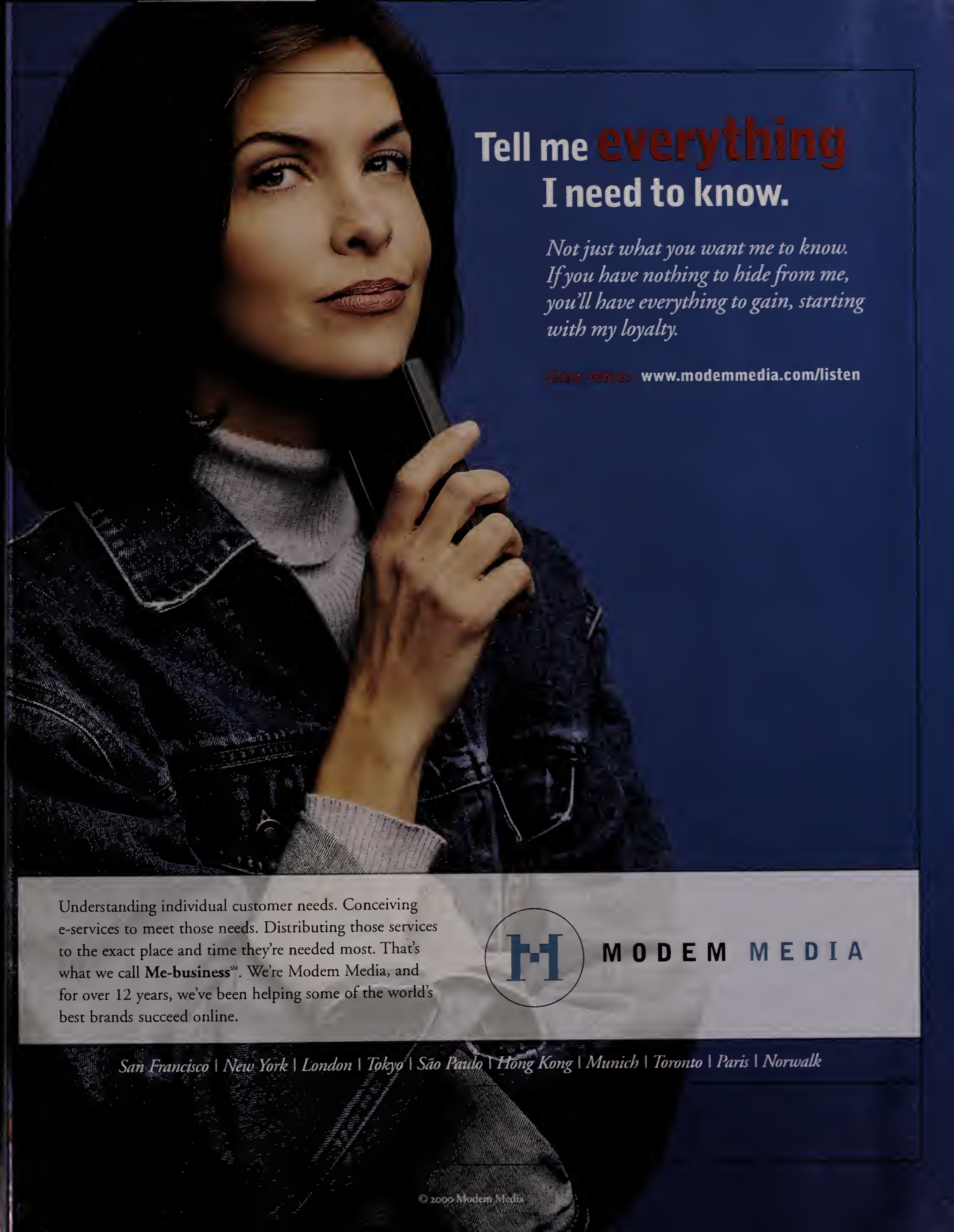
Elbaum gives an example from his days in IS at Cott Corp., a beverage company based in Toronto. In order to compete on price with behemoths Coca-Cola and Pepsi for business at major retailers, Cott needed to dramatically reduce its cost base. It redesigned its business processes in collaboration with its third-party bottlers. The resulting processes were not the cheapest way of doing business for Cott, but they lowered costs so dramatically for the bottlers that the total cost of delivering Cott’s goods to the retailers became attractive.

To accomplish the data exchanges needed for the new way of doing business, Cott signed a contract with SAP reseller Siemens, allowing the bottlers to also install SAP’s software, which the bottlers couldn’t have afforded on a standalone basis. So Cott’s integration plan included standardized data exchanges with supply chain partners, and the result was a dramatically cheaper way of doing business together.

In case all these carrots don’t sufficiently entice you to engage in a full-fledged integration effort, dotcoms have the stick handy. Online enterprises have venture capital to burn on building integrated systems from the ground up. Indeed, their entire business models are based on information flows to such an extent that they sometimes have the opposite problem: Access is too easy. “We’ve got the credit card stuff clamped down, but if anything, we have too much information access,” says Andy Martin, CTO of Garden.com, based in Austin, Texas. “Adding more security controls and constraints is our issue,” he adds. Electronic communication and free-flowing data allows dotcoms the ability to customize the e-commerce experience for each customer as well as to build an operating model with lower cost structures than their older brethren.

The first benefit of the integrated enterprise is the ability to deliver consolidated information to customers. Additional ROI comes in the form of lower costs of integration. “To me, the value proposition of a well-thought-out architecture is so compelling,” says Lloyd Taylor, CIO of agricultural and industrial giant Cargill in Minneapolis. Taylor’s company built its own message-based integration engine several years ago, and as Cargill developed interfaces to this central transport mechanism for each application, those interfaces went into a central library. “We could reuse these APIs, so the

cutting software costs. When connections to business partners are built into the integration plan, a higher order of efficiencies can be reached. Starting simply with electronic procurement, companies can move to disciplines such as collaborative demand forecasting and product design and development. Intertwining systems with suppliers and business customers allows companies to make dramatic improvements in their business processes, says Ted Rybeck, chairman of Benchmarking Partners, a consultancy in Cambridge, Mass. And those processes and technology links can lock in profitable rela-



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THE PIECES

Logically enough, end-to-end integration will be easier to achieve, cheaper and more reliable if the interconnections are put in place with a view to the whole. The integrated enterprise is a complex puzzle with many pieces.

Infrastructure Storage, bandwidth and processing power. A robust and connectivity-oriented infrastructure is an absolute must, and the volume of data to be stored, transported and processed will continue to grow. What will be stored online, nearline and offline, and in what formats? What data will be mirrored? How will integrity be ensured?

“We won’t be able to manage our data volumes in two years the way we do today.”

—Bruce Sink,
CIO, First Union Corp.

“We won’t be able to manage our data volumes in two years the way we do today,” says Bruce Sink, CIO of First Union Corp. in Charlotte, N.C. Sink already tends 14 terabytes (plus a mirrored copy) of core storage from the company’s transactional systems and plans to use an additional petabyte—that’s 1,125,899,906,842,620 bytes—of storage to handle check-image processing needs over the next five years. In fact, First Union is working in conjunction with three vendors, one apparently being storage giant EMC Corp., to develop a new data management model. Sink won’t disclose the details because the bank regards this model as a competitive advantage.

As for how all this data gets transported, Sink does not see the internet as the universal pipeline for integrating the value chain, especially with the recent spate of denial-of-service hacker attacks. “The transport mechanism is the biggest issue from a technical perspective,” says Sink.

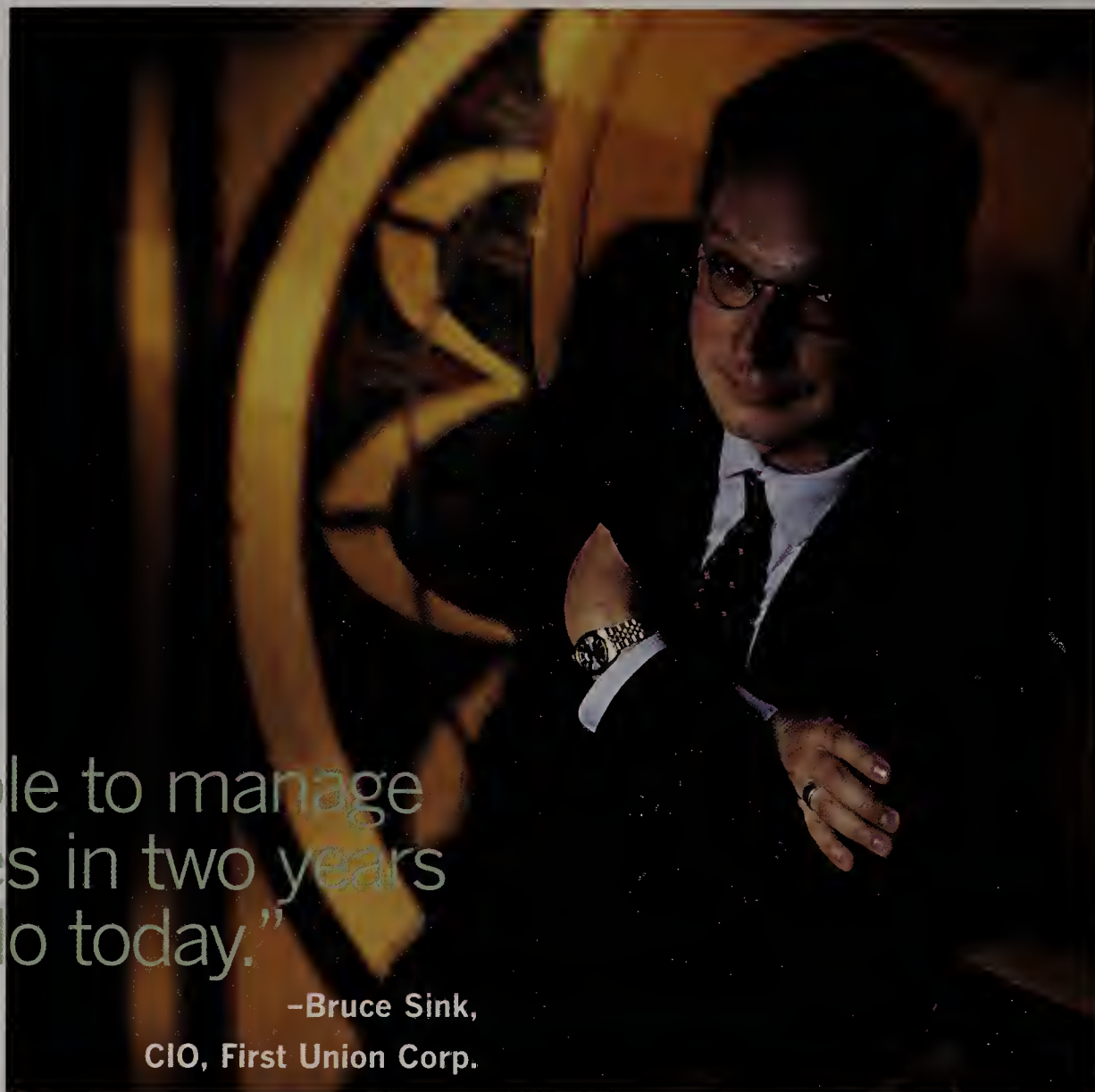
“How do you move three terabytes of information from point A to point B in a secure manner, and then query it without inundating [users] with data they can’t use? Those are questions we don’t have answers for yet,” he says.

Ambitious Applications Installation of an ERP system most emphatically does *not* create an integrated enterprise. It may be a huge building block, but it isn’t the whole story. Other crucial integrated functionality includes supply chain management, robust shop floor systems, customer-facing systems and some form of CRM or a customer life-cycle data warehouse. If applications for each of these functions can be bought off-the-shelf, and particularly if they have ready-made APIs that work with each other and with a central ERP system, then some of the integration challenge is reduced. Unfortunately, even the ERP vendors’ supply chain management solutions are notoriously diffi-

cult to integrate with their own software. Also, most of today’s CRM packages are quite limited in their scope, so that particular application set bears great scrutiny.

Middleware A single vendor isn’t going to shrink-wrap the integrated enterprise, so some glue between applications is necessary. There are many approaches to application interoperability (see “Middleware Demystified,” Page 126). No single solution fits every need, and users commonly face a trade-off between flexibility and speed. A coherent approach to middleware selections is a crucial element, with an emphasis on flexibility and standardization where possible.

The Will to Share Corporate culture is also key. Many companies, especially bigger and older ones, still labor against the reluctance of their own workforce to share information access. Unless people unlock their informa-



S C A L A B I L I T Y

Once upon a time,
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A program office puts the right kind of premium on integration work.

Linda Ergen,
EAI manager, Cargill

tion vaults, all the technology is in vain. (See "Human Error," Page 136.) Consistently communicating the business benefits and the overall vision to executives will eventually garner the support necessary to open those doors.

GETTING THERE FROM HERE

The integration journey begins with a single step: The vision needs to be clearly and repeatedly communicated. That is the most commonly overlooked step in the scramble to keep up with IT demands.

After that vision is in place, then—and only then—can you get on with more typical project management activities like prioritization. "There's probably one thing you'd better get done immediately, or a dotcom or competitor will come in and take it away from you," says Cecere. Identify the risks, rewards and urgency associated with each particular integration project, and prioritize the projects on that basis.

To handle the actual integration efforts,

Cecere says smart companies are creating program offices, akin to the groups that handled Y2K conversion efforts. Cargill is a \$46 billion example of this approach. In 1995, the company's biggest division (oilseed processing) undertook an ERP implementation but wanted best-of-breed software in each function. That meant integrating systems from different vendors—a notoriously strenuous task with such complicated and ambitious applications as ERP. The company needed something more robust than its existing, homegrown messaging integration infrastructure.

And so Cargill formed an integration "center of excellence" headed by Linda Ergen, enterprise application integration (EAI) manager, to offer the same expertise to other business units (which are responsible for their own IT applications). The company got consulting help from Hewlett-Packard for building a business plan and value proposition of the EAI center. Ergen heads a group of 13 full-time employees who consult with

the business units on architectural issues and develop the necessary software interfaces.

Call it a center of excellence, a program office or what you will—a group of this sort puts the right kind of premium and visibility on integration work and brings together the corporate knowledge of what's going on in various technologies as well as in various arms of a big company.

Giga Group's Cecere argues against working too hard to define the perfect end state of all integration efforts. "You can spend an enormous amount of time planning, trying to solve the whole problem," he says. Cecere likens overly holistic integration planning to corporate data modeling efforts of the '90s, when trying to establish ironclad, corporatewide definitions of terms like *customer*, *order* and *bill* proved largely unprofitable in the face of in-house politics and changing technologies and standards. And it's clear that nobody has time to waste.

Still, the benefits of a holistic and careful integration plan are too powerful to ignore. CIOs who do not take enough time to develop such a plan will see the pain currently associated with integration continue to grow with soaring data demand and application proliferation, since every new integration project will require starting from scratch again. Any data, from anywhere to anywhere in your value chain, at any time—it sounds extreme now, but when has the demand for data ever decreased? And for those with a vision in place, future efforts will start with a solid technical foundation already laid. **CIO**

Is an overall integration plan a waste of time and money? Tell Executive Editor Derek Slater at dslater@cio.com.

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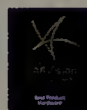
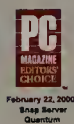
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Middleware

DEMY

This “connector” technology is a crucial element in the integrated enterprise, but it’s also a minefield of confusing jargon. Here’s a primer.

BY DEREK SLATER

C

onfused about middleware? Welcome to the very large club. It’s a term that expands and contracts in meaning over time and is used differently by a zillion different people with as many different agendas.

Unfortunately, discussions of middleware—even allegedly rudimentary ones—often start simply but spiral quickly into asynchronous queuing, object monitors and variations of the acronym COM. Here we endeavor to explain it all from the ground up.

WHAT IS MIDDLEWARE?

Essentially, middleware is software that connects applications, allowing them to exchange data. It offers several key advantages over hardwiring applications together, which typically entails adding code to all of the applications involved, instructing them on the particulars of talking to each other. Middleware adds an independent third party to that transaction, a translator.

Why Use It?

From a business standpoint, connectivity among applications is a given today (see “The Whole Is More Than Its Parts,” Page 116). Shop floor, inventory, accounts receivable and advanced planning applications need to communicate so that companies can make accurate

STIFIED

promises to customers, and executives can make educated decisions more quickly.

E-business in particular demands better integration by an order of magnitude. That's because web customers commonly want to see several bits of up-to-the-minute information at the same time—product specifications, availability, shipping times and account status. “Call centers have reps logged on to multiple applications [to answer those kinds of questions]. That's OK when you're paying them to do it, but when you start to let customers access that information themselves, it's too complicated,” says Karen Boucher, executive vice president of The Standish Group in West Yarmouth, Mass. Enter middleware to tie together all those apps and connect them to a web front end, hiding the complexity from the customer.

From a technical standpoint, middleware offers several benefits, depending on the type you choose:

Simplicity. In today's corporate computing environments, many applications have to share data. Putting middleware in the middle can mean each application needs only one interface—to the middleware—instead of a separate interface to each application it needs to talk to. (However, if you're connecting just two applications to one another, it might actually be more complicated to introduce middleware than simply coding the two apps to talk to each other.)



Persistence. Middleware can capture data and hold on to it until it has been recorded appropriately by all the applications or databases that need the information. In technical vernacular, this ability is referred to as "persistence."

Services. If your data needs to be checked for integrity, printed out, reconciled with data from other applications, merged, split or reformatted, various kinds of middleware can handle those tasks efficiently. This means you don't have to rewrite those services again and again for each application that uses them. As middleware products evolve, the breadth of services they can provide grows. Incidentally, vendors that sell such robust products often try to disassociate themselves with the term *middleware*.



for context. Both are older ways of handling application connectivity, particularly in distributed environments.

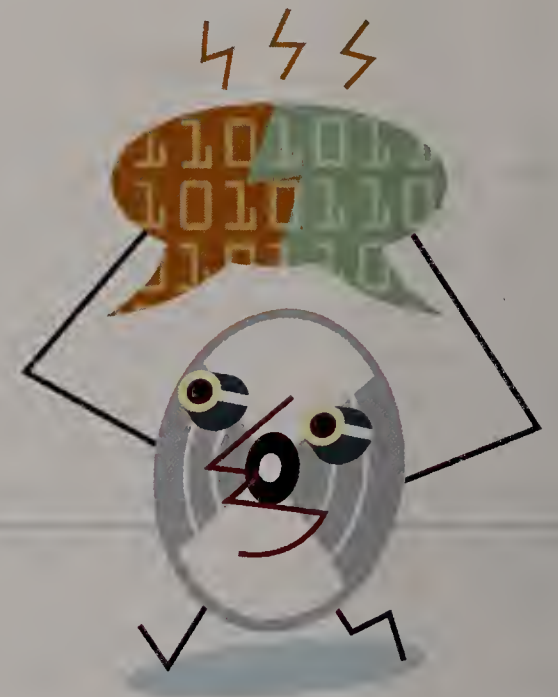
RPC stands for remote procedure call, which means a slice of code in a client application that invokes a procedure on the server application. RPCs aren't middleware proper by today's definition. Although still in use, they're the method that modern middleware often replaces because they require programmers to rewrite them over and over when wiring a bunch of applications together. Other middleware approaches are often more efficient as the number of applications grows.

Database gateways fit the definition of middleware better than RPCs, since they are a third party facilitating access to data. Database gateways connect applications to a particular kind of database platform. For example, consider a company with legacy applications and data residing on an HP3000 server. Many new shrink-wrapped applications are designed for accessing common databases like Oracle or Sybase, but they may need a little help connecting to the 3000's older TurboImage DBMS. That's a typical use of a database gateway.

If you understand e-mail, you understand the principle behind MOM. And as with e-mail, a key advantage of MOM is that the data from application A goes into a queue (a waiting line or holding pen, if you will) and can be retrieved later, if necessary, by app B. That protects the integrity of the data if, for example, app B happens to be down for a reboot at the moment app A is trying to pass along information. With this asynchronous approach, the middleware server waits for app B to get up and running again, then hands over the data in the queue in the right sequence. (This retention of the data-bearing messages is an example of persistence.)

Typical Usage

MOM is commonly used for simple, one-way exchanges of data where relatively few operations are being performed on the data and where the timing of the data



Why Is It Confusing?

Three reasons. One, the whole technology space is fraught with incomprehensible jargon because there is a lot of legitimate technical detail. (This article doesn't aspire to cover everything, just the fundamentals.) Two, the vendors regularly change their terminology and product names. Three, the products grow in functionality, which makes it harder to delineate categories.

TYPES OF MIDDLEWARE

It isn't uncommon for companies to have several types of middleware at work in a single enterprise, with different kinds proving more appropriate for different integration chores. Bigger companies, which usually have more complex integration requirements, tend to gravitate toward more sophisticated middleware products such as EAI.

RPCs and Database Gateways

Description

Perhaps not truly middleware but included

Message-Oriented Middleware (MOM)

Examples

MQSeries - IBM

MSMQ - Microsoft

SmartSockets - Talarian

Description

Dear old MOM. Message-oriented middleware takes charge of relaying data from one application to another by putting that data in a message format, akin to the way e-mail works. In fact, before off-the-shelf MOM products became prevalent, Cargill Corp., for example, built its own MOM integration tools by using the Hewlett-Packard OpenMail e-mail engine to move data.

exchange is not critical. For example, imagine a checking account that is linked to a savings account, which is tracked in a different database. When the customer updates his address for the checking account, the system is designed to update the address for all of the customer's accounts—but it doesn't matter much if the update takes three seconds or 10 minutes.

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Transaction Processing (TP) Monitors

Examples

CICS, OpenCICS - IBM

BEA Tuxedo - BEA Systems

Description

Transaction processing monitors have been around for some time (longer than MOM), having been developed originally for mainframe environments. TP monitors sit between front-end applications and back-end databases to manage the writing and reading of transactional data.

TP monitors are much more application-intrusive than message-oriented middleware. That means they demand more modification



of the applications themselves in order to take advantage of the monitor's specific services. They also provide extra security and data integrity protection.

Typical Usage

TP monitors are intended for heavy transaction load environments. Again from banking: All transactions recorded at ATM machines have to be managed carefully to make sure the institution keeps accurate tabs on customers' account balances. TP to the rescue. In particular, a TP monitor is useful when multiple applications need some of the same basic functionality such as security and directory services.

"The benefit is that as you write new applications, you don't have to keep rewriting these services," says Boucher. "Applications also talk to each other through this kind of middleware, but it goes beyond

that." TP monitors would be "overkill" for simpler, one-to-one application connectivity tasks, she adds.

Object Monitors

Examples

IBM Component Broker

VisiBroker Integrated Transaction Server - Inprise

Microsoft Transaction Server

Description

Object monitors, also called object TP monitors, are advanced versions of the TP monitors described above. An emerging product category, object monitors provide TP monitor functionality but are built according to object-oriented specifications like the object request broker models described immediately below. This increases businesses' ability to modify the services provided by the TP monitor, for example, without requiring changes to the applications.

Typical Usage

Electronic commerce applications such as online shopping carts and associated ordering apps tend to make use of object monitors. That's because e-commerce apps quite often need to draw data from many different sources and may also need to be modified frequently as the demand for ever-greater functionality grows. This need for flexibility makes a component-based architecture appealing because it lets you make changes in one part of the system without affecting the others. Web commerce also demands great data integrity and the ability to manage very high transaction volume.

Object Request Brokers (ORBs) and Their Architectures

Architecture Examples

Common Object Request Broker Architecture (Corba)

- Object Management Group

Enterprise JavaBeans (EJB)

- Sun Microsystems

Component Object Model (COM+)

- Microsoft

Description

ORBs mediate between applications and net-



work services (security, performance monitoring and printing, for example). They are a key part of broader architectural standards for building services and interoperable applications. The three standards efforts listed above are the key players. An example of an actual middleware product suite that implements one of these architectural plans is Iona Technologies' Orbix 2000, which is based on the latest Corba standard, release 3.0.

The premise behind ORBs is this: Many applications need access to the same set of services as well as to other applications. The reality of computing today is heterogeneous computing hardware and operating system platforms, plus applications built with a wide variety of development tools and languages. To get all of those components talking to each other, the enterprise needs a consistent, object-oriented architecture.

And with the increasing need for applications in one company to share data with business partners or suppliers, this kind of standardized approach can greatly simplify the integration chore.

Corba is historically focused on Unix envi-



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ronments, while Enterprise JavaBeans is an architecture best suited for companies developing in the Java programming language. The good news is that those two standards' efforts are meshing nicely. Corba adherents should be able to integrate Java development projects with a minimum of fuss.

However, Boucher notes that server objects designed under the Corba model don't currently communicate well with objects on a server that follows the COM+ model, and vice versa. This means large organizations are better off choosing one model or the other, not trying to mix and match. Users with Windows NT/2000 servers are likely to be best served by COM+, while those with Unix servers (even accessed by Microsoft desktops) are probable candidates for Corba.

A Special Note

Microsoft's middleware architecture and product plans have evolved, and so has its terminology, which is a source of some confusion for anyone who hasn't kept up carefully. The original designation was simply COM. Next came DCOM, for distributed common object model. According to Boucher, Microsoft has now done away with DCOM and moved on to the current name, COM+. COM+ is also part of a greater Microsoft architectural plan called DNA, for distributed network architecture. DNA includes products and services well beyond the scope of middleware.

Enterprise Application Integration (EAI)

Examples

ActiveEnterprise - Tibco Software

NEON Impact - New Era of Networks

e-Gate - Software Technologies Corp.

(STC)

BusinessWare - Vitria Technology

Geneva Enterprise Integrator (EI)

- Level 8 Systems

(And many, many others)

Description

Many vendors are likely to spit nails over calling EAI products middleware—a fuddy-duddy term compared with EAI, which incorporates the sexy word *enterprise*. But the basic idea of EAI is integration. Unfortunately the term EAI is also a hot one for marketing purposes, so tons of vendors are latching onto it even though their products provide widely differing functionalities.

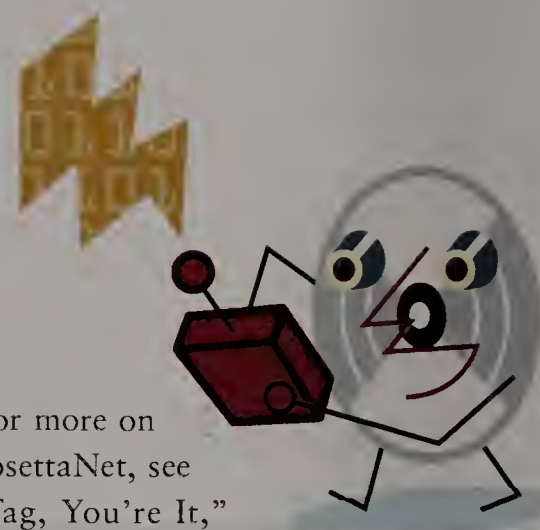
EAI is middleware plus. Like ORBs, EAI tools typically use a message broker as their underlying mechanism for data transport.

In addition, they can parse, duplicate or transform the data to present it in a palatable format for each idiosyncratic application that needs to receive the data. In a big company, a sufficiently robust EAI product could conceivably displace the use of lower-level integration tools like MOM, although the two can certainly coexist.

The next level of functionality for EAI tools, and probably the functionality that best distinguishes EAI from other forms of middleware, is the support for business process rules. EAI allows the user to define proper business processes and make data integration subject to those rules; for example, the data moves automatically from the purchasing application to the accounts receivable app, but not until it has been signed off by the appropriate authority.

According to Hurwitz Group, Vitria's product was the first to incorporate this kind of business process support. Now others are adding the function both inside the corporation and across corporate lines in the supply chain.

Extensible markup language (XML) support is a key addition to EAI products, as is support for standards like BizTalk (a Microsoft-sponsored set of business-to-business communication protocols) and RosettaNet, a consortium working to establish electronics industry communication protocols.



(For more on RosettaNet, see "Tag, You're It," CIO, March 15, 2000.)

With most EAI products, users purchase a central module and the specific interfaces they need. For instance, STC's e-Way product line includes separate "adapters" for SAP, Siebel, Lotus Notes and an array of back-end databases. Most EAI vendors also have a service branch to do custom programming if you need a connection to a homegrown application. "They seem to follow the 80-20 rule, meaning 80 percent of your interfaces will be prebuilt, and then they come in to do custom work on the other 20 percent," says John Campanale, vice president of ARC, a consultancy in Boston.

Typical Usage

EAI is suitable for big companies that need to integrate lots of applications. Cargill, for example, uses BEA Systems' eLink EAI product suite to interconnect a broad portfolio of apps including ERP, maintenance management, inventory and cost accounting systems, among others.

WHEW!

Which middleware is right for your company? There's no single answer. Different kinds of applications and integration needs are best served by different kinds of middleware. On the other hand, using a single approach can offer great economies of scale and development effort. At any rate, weighing the options is a lot easier when you know what the terms mean. **CIO**

Do you see middleware as mere infrastructure or the heart of enterprise computing? Executive Editor Derek Slater wants to know (dslater@cio.com).

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Your ability to think like a politician and a psychologist can mean the difference between success and failure in the biggest project of your career

BY ELANA VARON

The Defense Logistics Agency (DLA) thought it was on its way to achieving more efficient purchasing when it unveiled its Procurement Gateway website two years ago. The site was designed to draw from several integrated databases to provide solicitations, specs, drawings and other contract documents online. Its aim was to make it easier for vendors to sell to the agency, thereby attracting more bidders and better prices for everything from paint to parachutes.

But buyers at DLA, the part of the Department of Defense that provides supplies and services to U.S. military bases worldwide, were posting only about half of their requests for quotations (RFQs) online. Some resisted using the site; others simply forgot it was there. Either way, it was an extra step that offered little apparent return. Buyers found it easier to hand the information off to clerical workers to mail to bidders who asked for it.

Then last summer a reorganization sent 150 of those clerical workers packing, and the buyers were inundated with paperwork. That's when Gateway Administrator Rosanne Sarkissian, who manages the website from the DLA's Defense Supply Center in Philadelphia, saw a golden opportunity to show buyers how the site could help them do their jobs. By February 2000, buyers were using the gateway for 90 percent of their RFQs, saving the agency \$4 million in postage and cutting from three weeks to five days the time it takes for an RFQ to be awarded to a bidder.

In hindsight, it is obvious to Sarkissian that the buyers should have been trained at the outset. But in grappling with closing supply centers and cutting jobs, managers overlooked the need for training. And it took a near crisis—buyers unable to do their work—before managers realized they had not built enough internal support for integration.

ILLUSTRATION BY DARREN RAVEN

The DLA's saga is far from unique. The biggest challenge to integrating the enterprise isn't choosing the right hardware and software, or even crafting a sound business case. Whether it's a data warehouse, enterprise resource planning, knowledge management or a customer relationship management system, these projects founder time and again because the people who have to use integrated systems can't, or aren't convinced that they ought to. Yet shepherding diverse business divisions, each with its own culture and databases, through an integration project often gets less attention than either the technology or its anticipated ROI. Even when companies follow what they think are the rules—communicating their vision to employees and training them to use the new systems—success can be elusive.

It doesn't have to be that way. The advice that follows is common sense. But the obvious is easily lost amid the complexity and pressure of these all-encompassing projects. To recover it, ask yourself three questions:

How well do you really know your internal customers?

Do they trust you?

What's in this project for them?

UNDERSTAND YOUR CUSTOMERS

You may think that what happened to David Johns is so easily avoided that it could never happen to you. But Johns, CIO with Owens Corning in Toledo, Ohio, was sure he was doing everything right when, three years ago,



ERROR

Rosanne Sarkissian of the Defense Logistics

Agency found that the buyers should have been trained at the outset.



he was in the midst of deploying SAP's ERP system. The project's goal was ambitious: to integrate the company's supply chain for manufacturing insulation and other building materials. (See "Flipping the Switch," *CIO*, June 15, 1996, or visit www.cio.com/printlinks.)

After rolling out smaller versions of the system to two of the company's divisions, Johns readied his first major installation for the company's \$1 billion roofing products business. He thought he'd covered his bases

for the 32-location rollout. Owens Corning's top leaders were solidly behind the project. Executives and project leaders held "town hall" meetings and videoconferences to explain how the SAP system would make the company more efficient and help it pursue new customers. Workers were trained. But when they booted up that first morning,

work at several sites ground to a halt.

While there were some technical bottlenecks, more fundamental flaws surfaced as well. "One of the things we did when we trained people was [tell them] that they needed to pay attention to what the system says. [But] we didn't have processes well enough defined, [so] the system came out with bad answers," Johns says. Employees, doing what they had been told, looked to the system instead of talking to each other when common sense told them something was

amiss. In one instance, workers let a truck carrying a single pallet of shingles leave the plant—even though they knew it was a mistake—because that's what the system told them to do. Such errors were costly, Johns says. "One of the biggest costs of [producing] our product is logistics."

For the next deployment, Johns had workers kick the tires "dozens and dozens of times" before going live. For example, they entered test data into the system to make sure that orders placed would result in products being properly shipped and invoiced. Johns also modeled how employees communicated with each other, to make sure the system enabled them to get the information they needed at every stage of the manufacturing and distribution process. Previously, each location had operated almost as a separate business, with its own data flow. With more careful testing and planning, Johns and his team finally got it right. He notes that production planning now goes more smoothly and that Owens Corning has been able to reduce its inventory while providing better service.

"One of the things we never tested in the first major business [deployment] was the communications process end to end," Johns says. "It sounds pretty stupid, but believe me, we did it." Johns found out that employees had never quite absorbed the magnitude of the changes that the system would wreak. "We never validated that the people were getting the message," he says.

Johns' experience is typical. Corporate IT staffs and business-line executives alike get so immersed in big integration projects that they forget not everyone in the company understands the project as well as they do, says Michael Coover, a professor of psychology and director of the Institute for Human Performance, Decision Making and Cybernetics at the University of South Florida. Executives who are trying to meet project deadlines on top of doing their regular jobs get pressed for time, and communication with the rank and file about how the business will change consequently suffers.

Furthermore, the right people aren't always invited to participate in the neces-

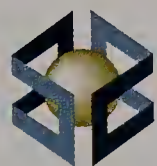
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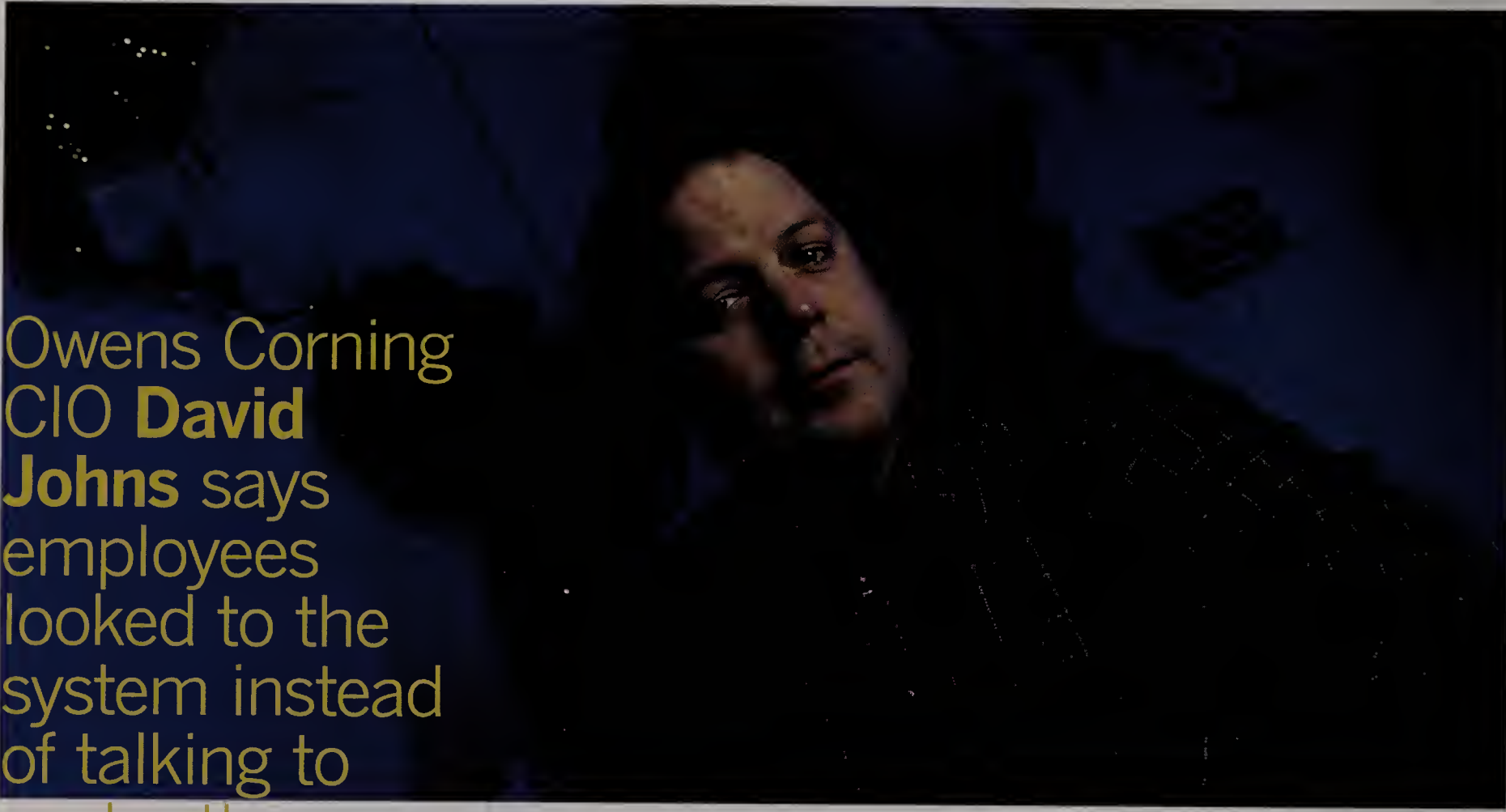


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Owens Corning CIO **David Johns** says employees looked to the system instead of talking to each other when common sense told them something was amiss.

sary business-process redesign, particularly key sessions where business units hash out what data is going to be included in the new system and how it will be represented. Accountants and human resources specialists can each make the case for their own data, but the team also needs people who understand the relative importance of each data set to the larger project, Coover says.

TRUST ME

Once bitten, twice shy is how Coover describes end users' attitudes toward major IT projects. "The way people react is tied to how they've been treated in the organization," he says. If there's a history of people being left out of the decision-making process, they may respond with suspicion, feel threat-

ened and be reluctant to cooperate, he explains. Before embarking on an enterprisewide project "you need to take a look at the current work climate," he says. "You have to look at morale, turnover, absenteeism, worker conflict." If you find trouble, you should take that into account when you assemble your team and be sure to involve people who can do something about it.

When Joe Cleveland, president of Lockheed Martin's Orlando, Fla.-based IT division, Enterprise Information Systems, started a long series of corporate integration projects five years ago, he knew he needed to convince business managers to trust him. The company had just been through a major merger with Martin Marietta Corp. and was about to merge with Loral Corp., and everyone knew management would be looking for ways to become more efficient. In fact, executives had promised shareholders to trim \$1.5 billion in IT expenses. But at the same time, the changes threatened employees who believed their jobs would be different, or eliminated, once new systems were in place.

Cleveland didn't have time to get to know the stakeholders among the 140,000 employees in the new company, so he put together

a transition team with IT representatives from its many subcultures. The team scrutinized every system and decided whether it should be retired or rolled out to the rest of the company. For some functions, existing systems were scrapped entirely in favor of brand-new technology. With each subculture represented, Cleveland says that employees could "feel comfortable that things have had a fair hearing, that people who know their culture are making a recommendation [and] that is the best decision."

That's not to say every decision went smoothly, or that everything was accepted by end users. Cleveland won't get specific—"to protect the innocent"—but says he sat through some tough meetings, including some with top executives, where arguments were made against integration. Opponents weren't only worried that a new system wouldn't meet their requirements; they also saw threats to their status within the company. Cleveland describes their arguments this way: "If you choose [the system that supports] my process, you'll also need me because I'm an expert on my process. If you choose another process, I have some catching up to do because those

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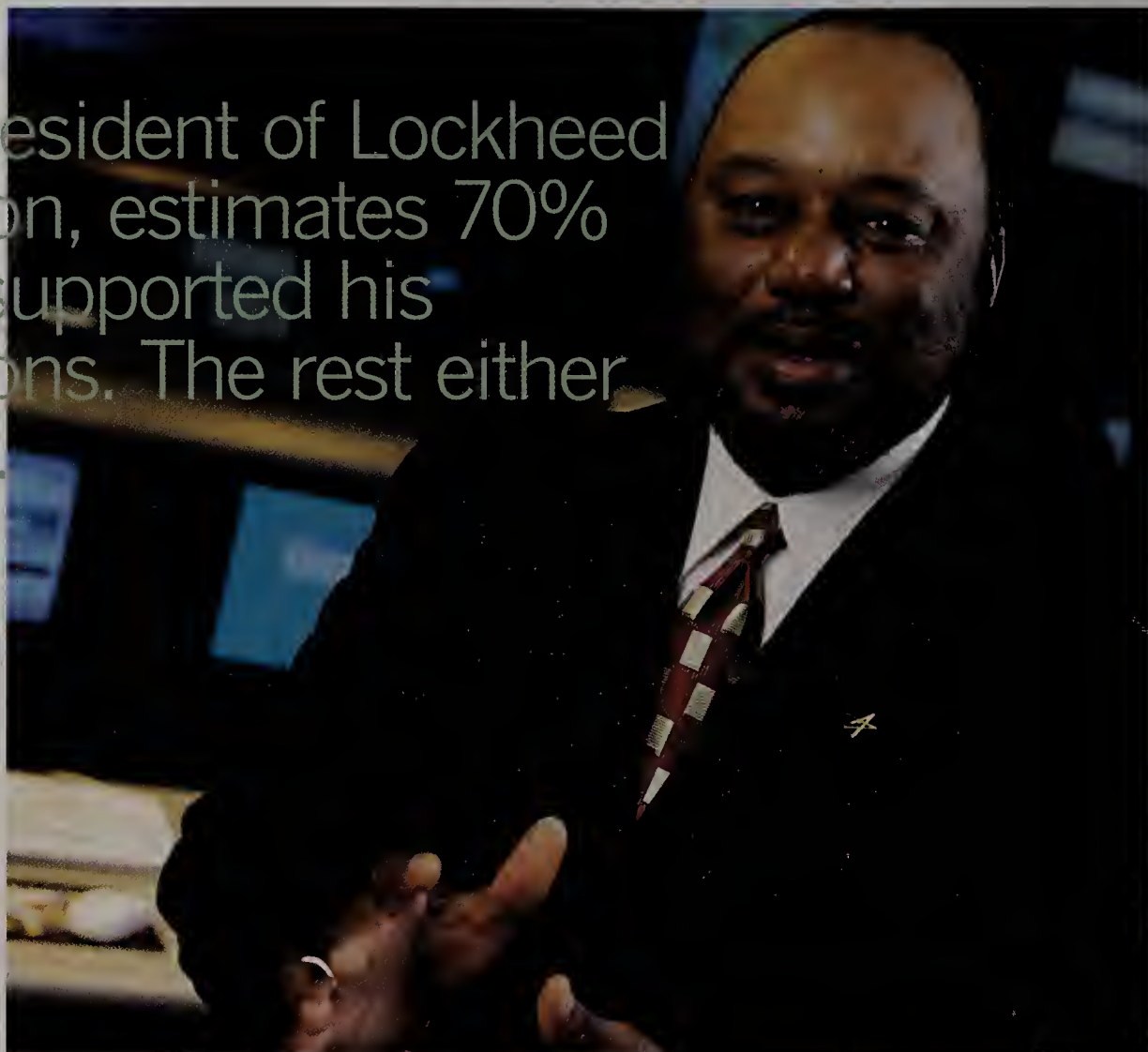
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intermedia
COMMUNICATIONS

Joe Cleveland, president of Lockheed Martin's IT division, estimates 70% of the workforce supported his integration decisions. The rest either acquiesced or left.

who know that process are the experts."

But, Cleveland says, he didn't dismiss any complaints out of hand. Some objections turned out to be legitimate. For example, the executives who ran Lockheed Martin's state and local IT services business, which supplies customers with engineers and software, argued against using a common procurement system geared toward buying parts for missiles and satellites. "Procurement was not a big part of their job," Cleveland says, so



The Power of Listening

For integration to succeed, the CIO must have a firm grasp on business needs

Southern California Edison Vice President and CIO Mavash Yazdi understood the importance of listening closely to her business colleagues when she launched a massive IT integration project two and a half years ago.

A response to deregulation of the electrical utilities industry, the integration project aims to create a common infrastructure to support corporatewide, integrated applications on 19,000 desktops run by a central IT organization. Edison wants to reduce overhead as well as pursue new markets abroad and sell new services like telecommunications to both existing and new customers. Sharing data about customers, suppliers and power plants companywide is one source of fuel for this growth.

According to Holly Kolinski, vice president of SCE's Mass Customer Division, the company has handled the transformation, accompanied by the consolidation of its IT operations this past January, much better than other companies she has worked for in the past. Kolinski recalls her experience at an international services organization where a similar revamp took place. "While there was a level of participation, it was presented as, 'This will be done,

and the organization will look like this, and you will interact this way.'" At Edison, she says, "there is an openness and a willingness to work together."

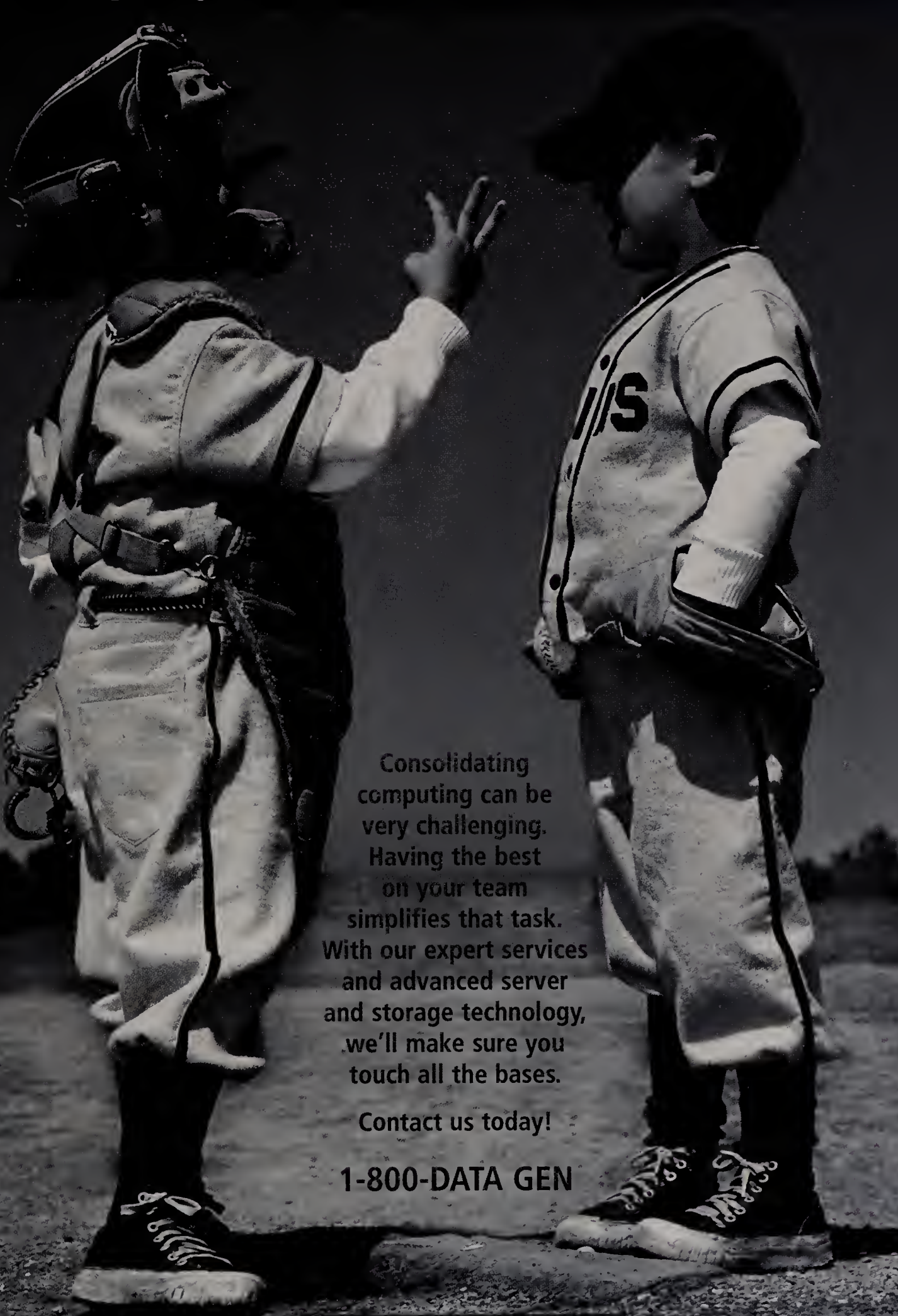
"We spent a lot of time with our business entities understanding the direction they're going," says Yazdi, who with her management team and consultants conducted one-on-one interviews with key internal customers and senior managers.

They learned that managers wanted assurance that with a central IT staff managing integrated systems, they would still be able to get someone on the phone when they had a problem. Yazdi responded by putting her customers in charge. She reorganized IT on a service model to make it simple for them to get their requests for IS services filled.

Kolinski says that partnership has been a critical factor in the smooth rollout of a new SCE customer service system, which has been designed with the extra capacity her department will need as the company grows. In addition, its ability to capture more information about workflow will help her make customer service more efficient.

—E. Varon

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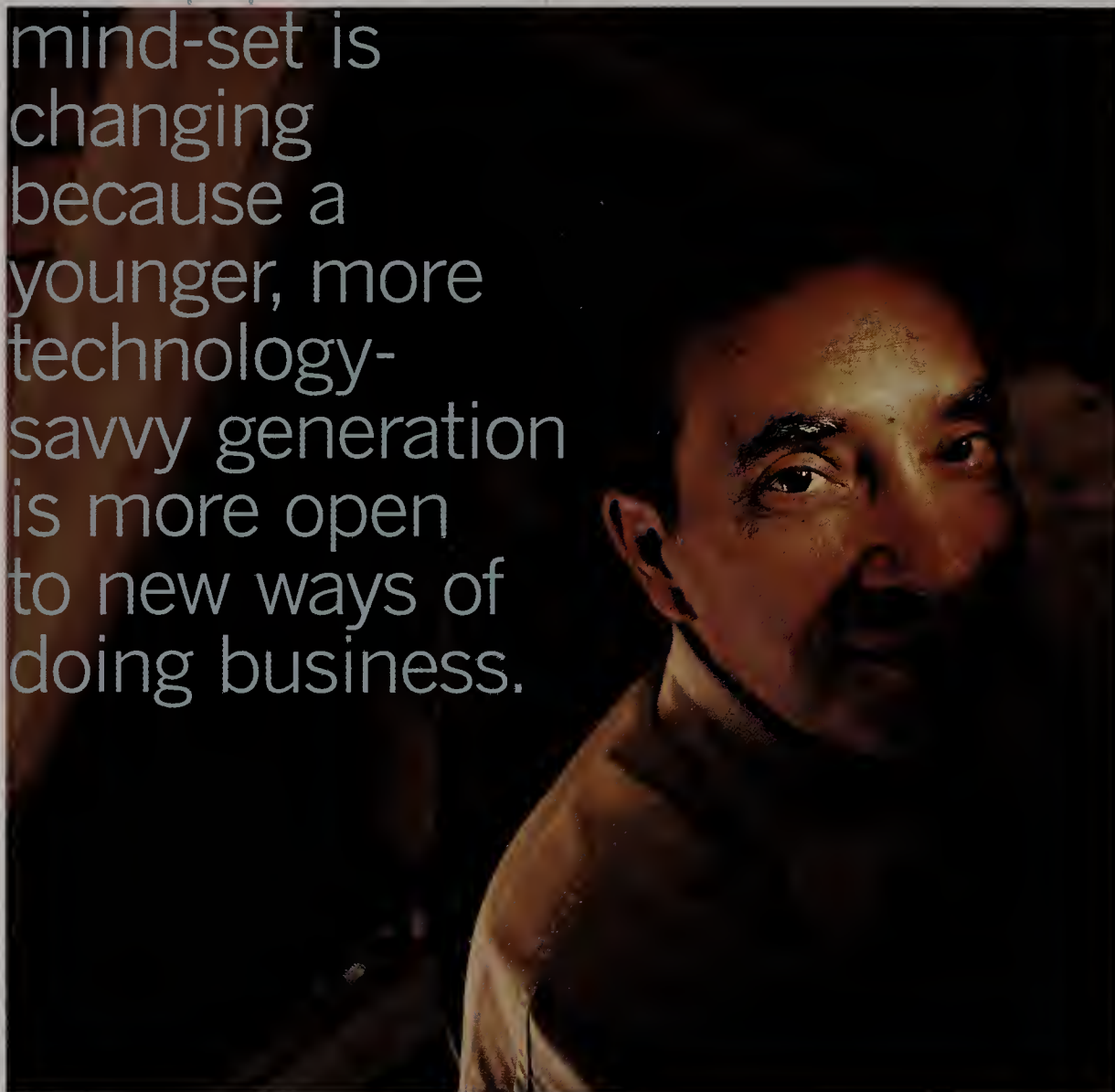
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doing business.



dard human resources management applications from PeopleSoft to automate routine tasks such as posting job openings, to standardize benefits and payroll, and to give managers a corporatewide view of staff assignments. Top executives tried to cajole reluctant human resources departments

it didn't make sense for them to make the investment. In general, the company did not insist that customer-facing systems, such as those that support manufacturing custom products or customer relationship management, be uniform. Because those systems have to support a wide range of customers' needs in addition to company objectives, one approach won't work for everyone. "As you move farther from the customer, it's more likely you are dealing with infrastructure," Cleveland explains.

That's why when it came to back-office systems Lockheed Martin held its ground. The company recently chose to deploy stan-

within the company by promising to reduce their paperwork, but they also made clear that corporate ROI from the PeopleSoft system (which will be fully installed in 2002) trumped any benefits to keeping homegrown applications, and they had to go along with the standard.

When he started out, Cleveland estimates 70 percent of the workforce supported his team's integration decisions. The rest, who bore the brunt of the changes, either acquiesced or left the company. "There were always people who did not agree with the answer, but if they thought the process was fair, they supported it," he says.

MOTIVATE EMPLOYEES TO CHANGE

When enterprise systems projects fail, it's usually because management has neglected to consider what will motivate employees to use the new systems, according to Leslie Wilk Braksick, who's president and CEO of The Continuous Learning Group, a Pittsburgh company that helps organizations anticipate how employees will respond to major business changes. "Rarely have I seen that [the problem is] really the wrong strategy or the wrong vendor," she says.

"Consequences drive so much of what we do. Most managers just communicate what they want done differently. They don't realize that reinforcers are built to enforce old behaviors," Braksick says. She tells of a company that installed a new financial management system to replace a set of spreadsheets used to produce financial reports. The president of the company didn't want to learn how to read the new reports. So his assistant kept generating reports from the old system and basked in his boss's praise. The lesson, says Braksick, is that unless end users get rewarded for contributing to or using a new system, they'll be reluctant to do so.

This problem has plagued the Department of Defense in its numerous attempts to integrate systems used across the department for administrative applications like procurement, finance and personnel. "The DoD as a whole is not used to being an information-sharing organization. There are many people who still feel that harboring information and letting that be their functional domain is more important than sharing information," says Marvin Langston, who was deputy CIO with the DoD until January, when he left to become chief operating officer of Salus Media in Carpinteria, Calif. Four years ago, the DoD canceled an integrated inventory-management system project after spending more than \$700 million, largely because business-line managers could not agree on what the system should do and wouldn't commit enough money to deploy it.

Langston says that stovepipe mind-set is changing because a younger, more technol-

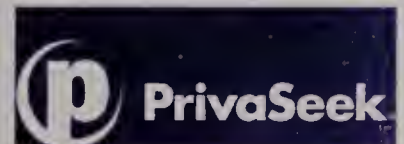
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ogy-savvy generation of both managers and end users in the ranks is more open to new ways of doing business. "They're impatient, and they're looking for us [DoD IT] to move faster," Langston says, making them natural frontline allies for IT executives pushing integration. It's also getting easier to persuade top officials to commit money to integration projects these days because without efficien-

cies from sharing data, it will be harder for them to fulfill their missions.

Getting the top brass to fund integration projects is critical because otherwise, base commanders, at the bottom of the military management chain, are left with the cost and the headache of deploying the new systems. Though they may support the goals of integration, spending money on such projects

means that other needs, more critical from their point of view, can't be met. But after a decade of DoD payroll cuts that cost thousands of jobs, senior managers have been more willing to set aside funds for integration. With fewer people to carry out support functions like acquisition and logistics management, "we're trying to get enough efficiency into product lines or functional lines so [we] have a snowball's chance of getting the job done," Langston explains.

Oh, Behave

Six steps to get user buy-in for integration projects

CIOs can anticipate which aspects of their enterprise integration projects will cause problems for end users by becoming aware of the messages they are—or aren't—sending along with new systems.

In a new book published in January, *Unlock Behavior, Unleash Profits: How Your Leadership Behavior Can Unlock the Profitability of Your Organization*, Leslie Wilk Braksick, a Pittsburgh-based business change consultant, offers help. She spells out six steps executives can use to specify the behavior they want to encourage from employees, identify the incentives—or lack thereof—for compliance and determine how they should encourage workers to change their ways.

At the core of her method, which Wilk Braksick calls Changing Yesterday's Behavior for Enhanced Results, or CYBER, is an analysis of the consequences of behavior. Consequences can be positive or negative, immediate or future, certain or uncertain. Managers should create consequences for employees that are positive, immediate and certain—and avoid those that are negative, immediate and certain.

Here are Wilk Braksick's six steps, and how you might use them:

- 1. Identify your business opportunity.**
Your CEO wants to see more repeat sales. You think a customer relationship management system will help.
- 2. Target results and measures for success.**
Loyal customers buy 10 percent more. They rave about the company 15 percent more often in customer satisfaction surveys.
- 3. Pinpoint and align behaviors that drive results.**
Sales and product support reps report customer contacts to the system weekly. They look up the latest info whenever they talk to customers.
- 4. Understand the influences on behavior.**
Salespeople will use the system only if it helps them sell more. Product support staff will use it only if it helps them resolve more customer problems.
- 5. Develop, implement and adjust behavior change plan.**
Company creates new sales/support teams assigned to customers, and team members get bonuses when their customers buy more. Executives publicize new sales and customer feedback that result from using the system. Managers make consistent use of the system, a requirement for a good performance review.
- 6. Celebrate achievement of improved results.**
Up to you.

—E. Varon

IT'S NOT THE TECHNOLOGY, STUPID

Corporate systems integration projects "are [usually] treated as technology projects rather than how business gets transacted," says Braksick. Instead of focusing on what she refers to as "screens and data," CIOs and system designers need to be more sensitive to why end users should want to use new applications. "You're changing how people have to interact with one another," she explains. "If their lives are made more difficult, it's going to be a net negative for them."

Johns of Owens Corning would agree. "We had systems and processes in place for 20 years, and people get used to that," he says. "We were very enamored of the technology itself. The IT piece of it is the smallest and easiest part, yet that was where we put our focus when we started this thing. You have to be enamored with the people aspect, the process aspect and the organizational aspect" of an enterprisewide project.

Lockheed Martin's Cleveland says that for enterprise integration projects to succeed, CIOs need to keep a constant eye on the entire landscape. "We looked at people, process and technology simultaneously," he says. By thinking about all three dimensions in tandem you can see more easily how changing one of them affects the other two, he concludes, and "you're less apt to make a false start." **CIO**

Senior Writer Elana Varon enjoys change, as long as she can fit it into her routine. Share with her your stories of integration battles lost and won at evaron@cio.com.

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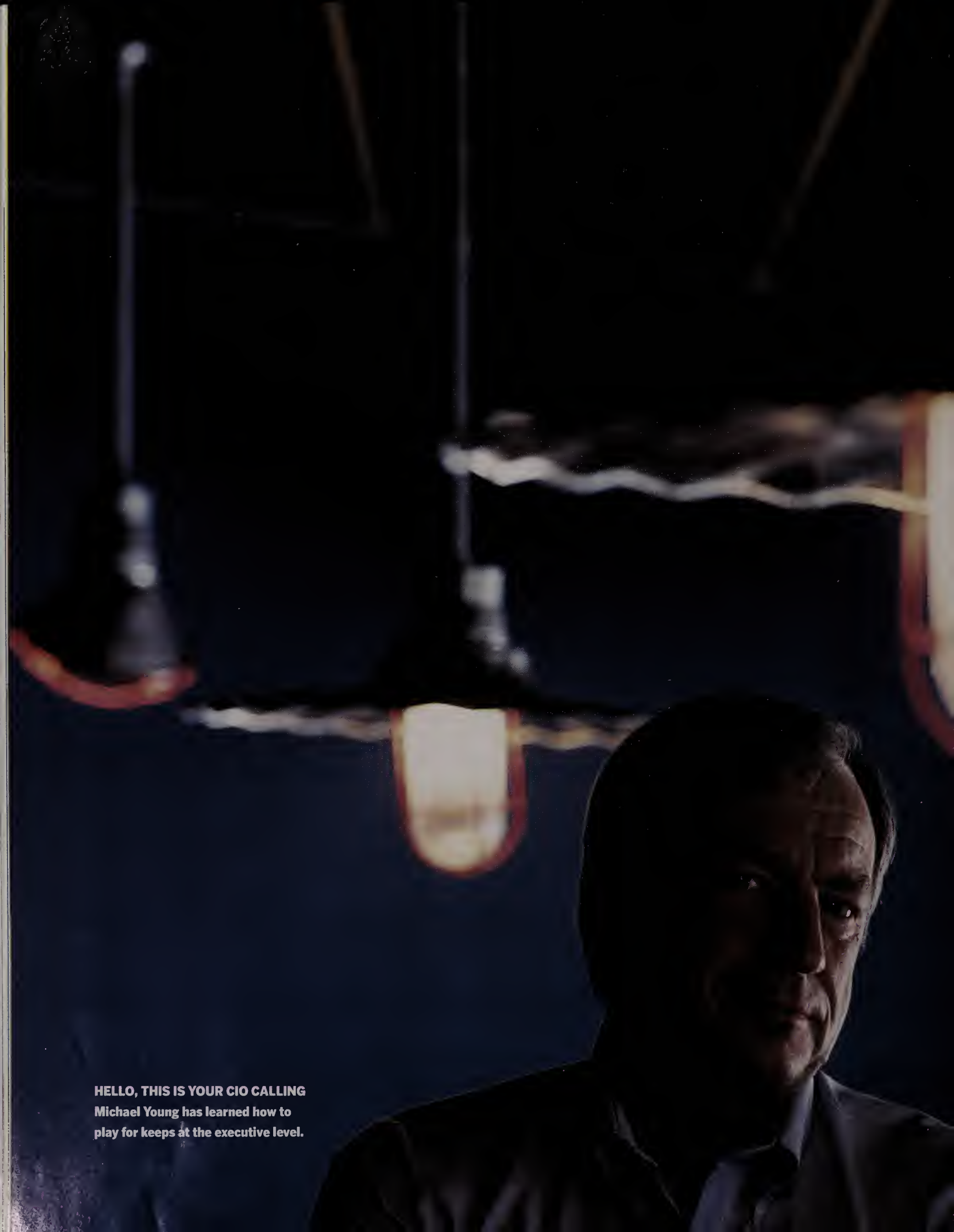
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HELLO, THIS IS YOUR CIO CALLING
Michael Young has learned how to
play for keeps at the executive level.

THE SIXTH MAN

BY MEG MITCHELL

How one CIO became a key player for his executive team

If there's any meeting that should have Michael Young feeling a little nervous, it's this one. On a warm Tuesday afternoon in early February, the CIO and chief e-commerce

officer of Hello Direct is preparing to present his IS plan for the coming year to the other five members of the company's executive staff.

Reader ROI

- ▶ Learn tips for presenting information to your board
- ▶ Rediscover the benefits of communicating clearly about IT projects

PHOTOGRAPHY BY MARK ROBERT HALPER



His plan for the San Jose, Calif.-based company, which develops and direct markets desktop telephony products, is ambitious: It includes 45 different projects that will require the participation and understanding of eight different functional groups within the company. And Hello Direct is facing some formidable challenges as it tries to meet industry changes and move itself from a direct-marketing model toward web-centric

sales and customer service—straddling the old business model and the new, and making sure it doesn't fall into the gully that lies between. To make matters more complicated, Young has an audience today: a CIO reporter and a professor from Stanford University's Graduate School of Business who are there not only for the free lunch but to watch and analyze his every move. So why does this CIO look like he doesn't have

WALK SOFTLY AND CARRY A BIG NOTEPAD
Young in action at the weekly meeting.

a care in the world?

Because to hear Young tell it, he seems to have achieved that ideal whose refrain has become so tired it could use a good nap: Align IS with the business. But as the meeting begins, two questions emerge. First, has he really done it? And if so, how?



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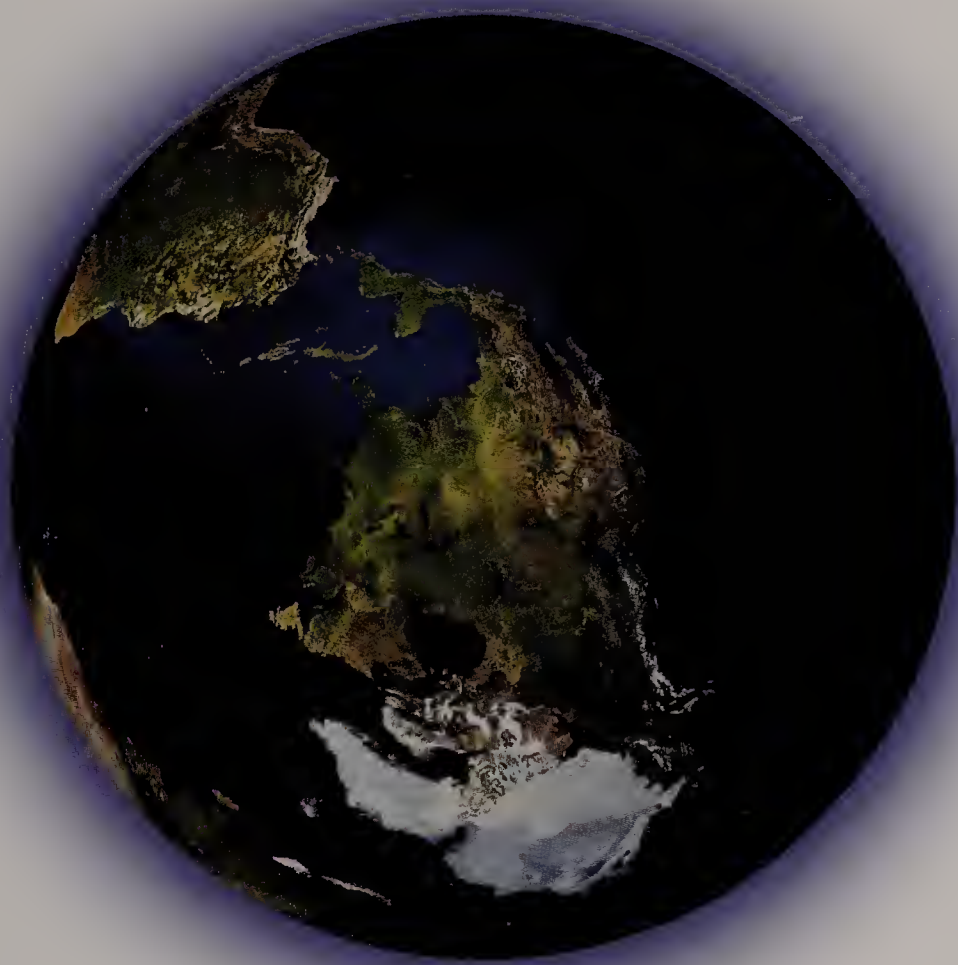
The Meeting

Hello Direct's six company officers (see "Dramatis Personae," Page 160) meet every Tuesday, when travel schedules permit. Once a week may seem ambitious, but according to CEO Alec Glover such frequency helps the company keep its focus and reevaluate potential problems before they spiral out of control.

Meetings, which start at noon and can go until four or five o'clock, take place in a glassed-in conference room. On one side of the meeting room is the inbound and outbound calling center—a collection of low cubes covered in cheerful red and green colors. On the other is the area where Hello Direct's engineers create the company's proprietary telephony products, such as cellular headsets, speech recognition software and digital recorders.

TAKE A LOAD OFF A close relationship with his CIO means CEO Alec Glover can rest easy every now and then.

As this Tuesday's meeting begins, Glover, a five-year veteran of the company who served as executive vice president and president of Hello Direct after a long stint at Kransco, a toy and sporting goods company, passes out sheets of paper with the agenda for the meeting. Besides a business and oper-



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BECAUSE CUSTOMERS DECIDE

ational review, the main item for this week is a report on IS plans for 2000. So after everyone is settled, Young launches into his plans for the year, which have three main components: web, web and more web. It quickly becomes clear to the observers that

visitors can see that conference rooms are all named Hello in different languages; just beyond the entrance are Aloha and Ciao. And though the building's setting is cheerful and open—colorful cubes and mylar balloons from a recent team promotion reach to

Young and Glover first met when they worked together at Kransco. Glover joined Hello Direct in 1995, and Young worked there as a consultant until Glover managed to nab him full time in January 1999. "I just came for the free lunches," deadpans

IN 1997 THE COMPANY WAS NOT PRODUCING THE KIND OF PROFIT COMPANY OFFICERS AND INVESTORS WERE HOPING FOR.

Hello Direct is undergoing a fundamental shift in the way it does business, and it's equally clear that the CIO is central to that.

The Company

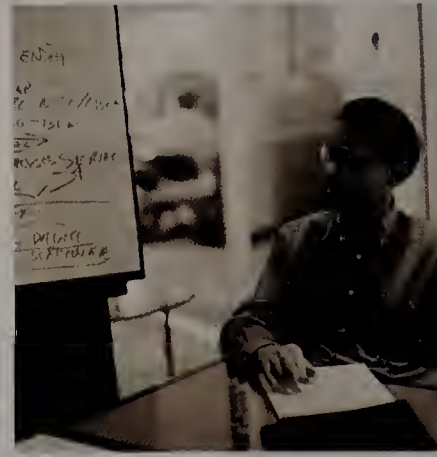
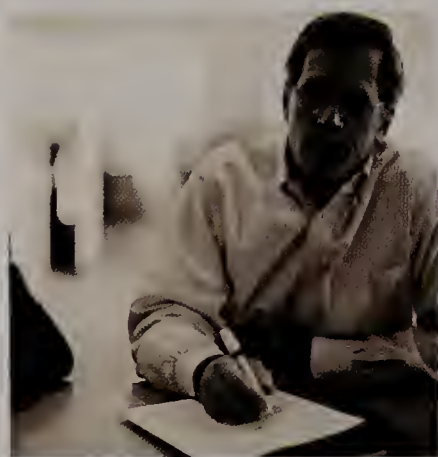
Born in 1987, Hello Direct sits just off Highway 101, the freeway that connects Los Angeles and San Francisco and runs through the center of Silicon Valley, in front of a breathtaking span of hills and valleys that screams developer's dream. The company's setting may look grand, but its

the high ceilings—a couple of years ago the business outlook was less than buoyant. In 1997, Glover explains, the company was not producing the kind of profits company officers and investors were hoping for. And at a time when the online revolution was sweeping the area, Hello Direct—though it had its website (www.hellodirect.com) in place—still made 80 percent of its profits from catalog sales and only 2 percent from e-commerce (the remainder came from outbound calling). It was clearly time for a change.

"In 1997 we kind of called a time-out," says Glover. "We took the company apart and put it back together again." This

Young, but it's clear that an already strong relationship with Glover had a lot to do with his decision to join the company full time. (Note to ambitious CIOs: Wherever possible, try to work someplace where the CEO is your buddy.)

When Young joined the company not only were direct marketing and manufacturing costs skyrocketing, but antiquated systems couldn't keep track of customers and address repeat problems. The marriage of business with technology was supposed to help with this, but, like many a modern union, the process involved heavy negotiation on both sides.



target market is less so. Hello Direct aims its sales at small and midsize businesses and, increasingly, individuals whose growing love affair with telecommuting produces a market ripe for the company's products. Walk through the front doors of the building—where, oddly enough, the receptionist talks into a regular, old-fashioned receiver—and

Humpty Dumpty approach included taking a careful look at how the company was serving customers and how that could be improved with new technologies. The outcome? Hello Direct resolved to shift its business model from direct mail to online customer support and sales. And that's where Young comes in.

Now Hello Direct is in the middle of a five-year journey toward web-enabling the entire company that hopes to benefit both its customers and its sales and customer service centers. Today, even someone who buys products from the website has to pick up the phone to check order status; the plan is that by the end of the second quarter (June 30) all



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that functionality will be on the web. In addition, employees in the call center will use a new system called Knowledgebase—which stores technical specifications for Hello Direct's products and has natural language capabilities—to pinpoint customer problems

making room for technology. "We've even got Denny [Waldera, vice president of direct marketing] using Microsoft Outlook now," jokes Young. CEO Glover admits that he and Waldera are the dinosaurs when it comes to getting used to new technology.

sheets of paper. The list is long, and there's a lot of information to take in at once. The projects are organized by type (back-end, business-to-business, e-commerce, personalization) and this list also catalogs each project's name, a brief description, the benefited

THE EXPANSION OF TECHNOLOGY BRINGS IN ISSUES THAT HIT EVERYONE CLOSE TO THEIR OWN DEPARTMENTS.

or specific products with just a phrase. Plans for this year also include implementing Knowledgebase in the sales department and adding it to Hello Direct's website. Young has a separate team in San Francisco that handles the e-business side; like the San Jose office's IS group, it consists of six full-timers and 20 consultants.

During today's meeting—in the Hello room—Young mandates that all new purchases must contribute to the company's web-enabling goals—if they don't, the CIO has to approve them personally. The company has already gone through the hard part of creating a solid infrastructure—a process that involved some definite haggling. "If you'd come to our meetings then it would have been a slightly different environment," says Young of the earlier days. "I had to prove myself and my team [in the beginning]. We were under the usual pressure for about the first six months." But now officers are

Issues? What Issues?

Young takes the other officers through the pages of his presentation: eleven sheets of bright blue and white PowerPoint printouts (he intimates that the color is there only to impress the visitors) with just a few lines of text. It's easily digestible, listing IS goals, such as customer personalization and back-end systems, with just a phrase or sentence to explain. Young moves quickly through the presentation; it's up to the officers to figure out what page he's on and follow his thoughts. And if Young's manner isn't brusque, it's not exactly coddling either—he's not asking for permission or approval, just showing what he has.

But while the PowerPoint outline is easily swallowed, the specifics of the IS initiative crowd together in a tiny font on two other

groups, completion date and labor costs. Projects include automated credit card approval, specialized web pricing based on customer profiles and a managed mass e-mail system.

By now the food has arrived. The room falls silent for a few minutes as everyone takes in both lunch and the project list. Then Glover and Vice President of Product Marketing Ron Becht wonder if maybe the plan is too ambitious. No, says Young, gently but firmly. The only way to keep the highly valued consultants and IS staff coming back is to give them plenty of projects that will challenge them; if Young doesn't, Hello Direct will lose its talent to the yawning mouth of the Silicon Valley monster. Then Young acquiesces slightly. What if we make web enabling the call center an A priority and web enabling the customer a B priority? OK, say the others through their salads and sandwiches. Sounds good.

DRAMATIS PERSONAE

ALEC GLOVER, president and CEO

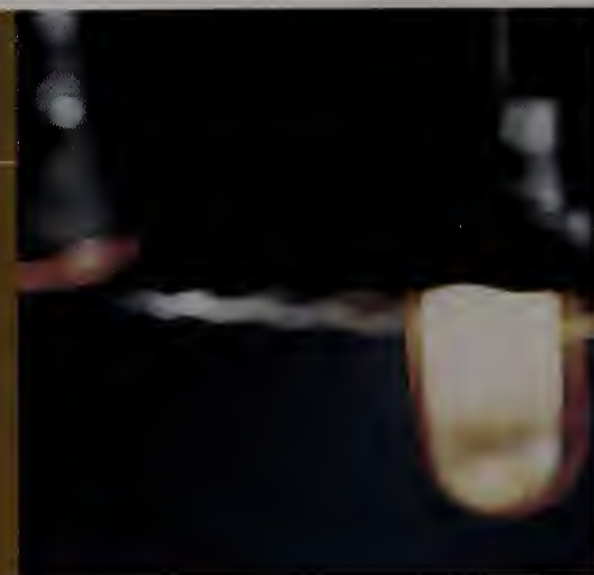
DEAN (KIP) WITTER III, CFO

DENNIS WALDERA, vice president of direct marketing

RON BECHT, vice president of product marketing

RUTH GROUELL, vice president of organizational development

MICHAEL YOUNG, vice president and CIO





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John Samuel, VP,
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Geoff Moore, chairman and founder of The Chasm Group, is among the world's foremost high technology marketing gurus and was recently named one of the Elite 100 leading the digital revolution. A prolific author, his latest book, *Living on the Faultline: Managing for Shareholder Value in the Age of the Internet*, provides new models to help analyze and change current business practices to meet and surpass the challenges of the marketplace.

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Katherine Hudson is president and chief executive officer of Brady Corporation, a \$471M international manufacturer of identification and material

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All participants are invited to attend a special black tie reception, dinner and awards ceremony on Tuesday evening recognizing this year's CIO 100 Award honorees. The "Oscars" of the IT industry, the event features champagne, a six-course gourmet dinner, and presentation of the CIO 100 Award to all honorees.

SYMPOSIUM MODERATOR



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But wait a second. Are these guys for real? What happened to conflict, to CIOs fighting tooth and nail to defend their plans and secure their budgets?

Later conversations reveal that this isn't the first time the IT plans are appearing. "We use a top-down and bottom-up approach," explains Glover. The officer group works with the senior managers—a group of 20 divided into functional areas—who are apprised of plans as they develop. Debate over priorities often takes place in those meetings. Each project has a team that includes an information systems champion and a senior management champion. For example, the key person implementing the outbound contact management system is the director of corporate accounts. "If he and his managers aren't present at the training, and if they don't sign off on how it's actually going to work in their departments, we won't do it," Young says.

"It's probably taken the group two years to get to this point of commitment," Waldera explains later. "We have had from time to time different points of view regarding how fast and aggressive we should be." Waldera classifies his own approach as staying "on the curve" rather than ahead or behind it; at times that was at odds with Young's full-steam-ahead approach.

But what comes through loud and clear in the meeting is that the expansion of technology brings in issues that hit everyone close to their own departments. For Ruth Grouell, vice president of organizational development, new IT initiatives mean new training for the staff in the call center, where turnover is high and employees don't always want to take the time to learn new systems.

Glover reveals that at a recent employees' lunch the staff expressed concern about the time they spent training. "I think they question the timing," says Grouell, who points out that the new system appeared at a busy time in the call center rather than in January, when the phones were quiet. "Could we not have organized it better?" Young laughs ruefully. "Yeah, we could have." But employees have come a long way, he reminds them.

EXPERT COMMENTARY

BY MICHAEL MORRIS

Fighting the Curse of Knowledge

Information technology divisions have become increasingly differentiated within organizations. A CIO may lead a group of specialists with technical languages and occupational cultures distinct from the rest of the company. Sometimes the division is even located separately as well. Hence the CIO in a top management team must act not only as a technical planner and problem solver but also as a translator and ambassador. Many a technically competent CIO has foundered in these latter roles.

More generally, technical divisions of large organizations—for example, Xerox Parc in the 1970s—have often failed miserably in transferring knowledge. In recent research, Chip Heath, a professor at Duke University's Fuqua Business School, and I have maintained that some failures of knowledge transfer stem from social psychological dynamics—obstacles that, once understood, can be overcome.

The meeting at Hello Direct illustrates these challenges well because, although CIO Michael Young is an experienced communicator, signs of strain in cross-functional communication are nevertheless present. To understand failures in communication between specialists, it's important to recognize the "curse of knowledge"—that phenomenon where possession of expert knowledge of a particular kind makes it more difficult to remember or imagine what it is like to not

possess the knowledge. As the reader may recall from university days, a professor's subject expertise can often get in the way of clear communication. Likewise for a CIO trying to explain a futuristic information system to the rest of the organization, the shared knowledge, language and culture of the IT group becomes an impediment.

At Hello Direct, Young's lucid report to the board no doubt benefited from his years of experience outside of IT, yet even he lapsed into opaque specialist language when he became excited about particular projects. At these moments, some of the other executives glazed over and others interrupted with demands for clarification. More important than these lexical lapses, "the curse" also manifested itself in recurrent failures in the past year to budget sufficient time for employee training and adjustment to new systems. In sum, while Young's experience outside of IT enabled perspective-taking, which helped him as a translator and ambassador, some minor failings revealed a vulnerability to letting his knowledge impede his estimation of the difficulty of knowledge transfer.

Michael Morris is an associate professor of organizational behavior at Stanford University's Graduate School of Business and has studied and written about interpersonal and intergroup conflict resolution.



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—Michael Morris, associate professor of organizational behavior, Stanford University

“We had keyboard training only 18 months ago.” Waldera joins the discussion: “[Employees] bear the predictable brunt of doing it one way on Friday, learning a new way on Saturday and not having to miss too many beats come Monday.” While the company is undertaking a fundamental transition, it doesn’t have the luxury of relaxing short-term performance metrics.

Maybe everyone seems so agreeable because somehow Young has a knack for introducing the technology without making a big fanfare about it. When Young first brought in the system that later became Knowledgebase he eschewed the usual practice of asking for approval to set it up. Instead, he worked on the sly with the vendor to set up a minipilot, which he then showed to the other officers. The approval was unanimous. Call it what you will: self-assurance, daring, supreme confidence. Success.

Asked later what it is that makes the communication between IS and the business successful, Young answers with a laugh that stops just this side of cocky. “This is going to sound awful. But it’s me.” In addition, he gives credit to a bunch of talented people working for him and the organization’s emphasis on teams and training that makes it easier for the business and technology sides to come together.

What about the concerns of some of the officers that the plans for 2000 are too ambitious? “I knew they were going to say that,” he admits. Sure, he harbors a doubt or two that his team will complete every single thing on that list. “But what I have no doubt about is that we will do what they expect and more.”

Analyze This

But what’s going on under the surface? Michael Morris, an associate professor of organizational behavior at the Stanford Graduate School of Business, has studied and written about interpersonal and intergroup conflict resolution. What, according to Morris, does Young have going for him?

It never hurts, for one, to have years of experience working with the CEO in your favor. But beyond that, observes Morris, Young knows he’s a hot commodity in a labor market that’s tighter than the turns on Lombard Street. And he’s done a crafty thing by keeping the San Francisco office that handles e-business a good 50 miles away from the rest of the group. Whether this is by accident or design, it means that Young is the only one who communicates e-business to the officers. “A person holds the power when he controls the resources at a particular point in time,” Morris says. “This company has a chance to get on the web bandwagon and [Young] can make that happen.” In addition, Young’s interpersonal mechanisms pass the test: He’s polite, considerate, upbeat. “He doesn’t react when people get critical or defensive,” says Morris.

Young’s faux pas? Organizing the list of IS projects in a seemingly arbitrary fashion was asking for people to be overwhelmed by it, Morris says. And so it was natural that each of the officers would automatically want to see it reorganized from his or her own point of view. Grouell made the point that her list should be sorted by which employee group is

affected; Brecht wanted it sorted by products, and CFO Kip Witter by cost. Morris points out that Young could be more sensitive to that natural propensity and offer information in a way that makes sense to each functional area.

As for Hello Direct’s top-down and bottom-up approach to IT initiatives, Morris points out that most of the people hawking headsets in the call center are not necessarily there for the long haul; the illusion that they’re helping to set business strategy might not compel them into acceptance of a plan that requires extensive training. In addition, the fact that Young spends only two days a week in the San Jose office means that other officers have more of a feel for what’s going on in the rest of the company. Grouell and Brecht both expressed concern about making sure the IT decisions are understood companywide; for Young that’s easy to overlook. So while he has the power, he trades it for some of the inside knowledge.

Also, Morris points out, despite Hello Direct’s claims of success, the company’s stock price has not exactly skyrocketed. And in stock-crazy Silicon Valley, that speaks volumes.

So has Young achieved that perfect balance of IS and business that many CIOs seek? According to what happened on this particular Tuesday, sure. But the next Tuesday holds another meeting. And another opportunity for the officers to embrace or challenge Young’s vision. **CIO**

What’s the recipe for success on your executive board? Let Senior Writer Meg Mitchell know at mmitchell@cio.com.

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A full-page photograph of a woman, Patricia Thompson, standing on a beach at night. She is wearing a dark, textured suit and is looking out towards the ocean. The background is a dark, silhouetted landscape with a fence line visible in the foreground. The lighting is dramatic, with the woman's face and suit catching some light against the dark background.

*After integrating more than 40 systems as part of a health-care merger, CIO **Patricia Thompson** had to separate them again two years later.*

As the nation's health-care system continues to fail, hospitals, HMOs and insurers turn to technology to provide a cure. And it will...in, oh, about 10 years.

The Waiting Game

BY MATT VILLANO

The best-laid schemes of mice and men often go awry.

So, roughly, wrote the poet Robert Burns back in 1785. And so it was when Penn State University's Milton S. Hershey Medical Center merged with nearby Geisinger Health System in July 1997 to create the Harrisburg, Pa.-based Penn State Geisinger Health System.

The merger made sense at the time, of course.

Reader ROI

- Find out why health care desperately needs IT
- Learn how electronic medical records and e-health could save the day
- See what health-care CIOs are doing to cope until that day comes

The two hospitals were hoping to cut costs, combine purchasing power and create economies of scale. To that end, CIO Patricia Thompson was charged with making one information technology

PHOTO BY KATHERINE LAMBERT

department out of two. And she knew just how to do it. Mere days after the union was announced, she unveiled an aggressive, \$20 million project to standardize applications and integrate Hershey's and Geisinger's technology platforms. Her goal: seamless integration before Y2K.

By spring 1998, Thompson had integrated more than 40 separate systems, eliminated redundancies and increased efficiency across the board. But late last year, after months of squabbling over policy decisions such as relocating data centers, members of the new organization's board of directors decided that the merger had been a mistake.

Citing "irreconcilable differences," management agreed to dissolve the merger.

The board told Thompson to undo everything she had done two years earlier. At an estimated cost of approximately \$20 million, she has to replicate all systems by June 30, 2000. "I'm not looking forward to taking everything apart," says Thompson, "but what else can I do?" (Shortly before press time, Thompson announced that she had accepted a position at Epic Systems Corp. of Madison, Wis., starting May 15.)

While Thompson's task is uncommon and uniquely frustrating, she is not the only health-care CIO with serious problems.

Across the industry, dwindling reimbursements and financial pressures brought about by managed care have wreaked havoc on organizations of every shape and size. Costs are rising like a day trader's blood pressure, optimistically begun mergers are failing and breaking up, and hospitals and health maintenance organizations (HMOs) are faltering like never before. More than 15 HMOs went under last year alone. Perhaps the biggest casualty to date occurred last January when the 1.1-million member, Wellesley, Mass.-based Harvard Pilgrim Health Care was thrown into court-ordered receivership after discovering it had underreported its \$177 million 1999 loss by about \$77 million.

No matter where you look, the condition of the country's health-care system is best described as critical. As losses mount, and seemingly with nowhere else to turn, many health-care leaders are now looking toward their CIOs, hoping that technology can stop the hemorrhaging. So far, most CIOs have responded with aplomb, engineering a bevy of far-reaching efforts to contain costs, increase standardization, improve the quality of care and prepare for the future. Many of these efforts have helped, but none has proven to be foolproof. CIOs, meanwhile, say that while IT isn't a panacea for the ills of the health-care system, it just might be the best way to reverse the downward spiral and give it a chance to start anew.

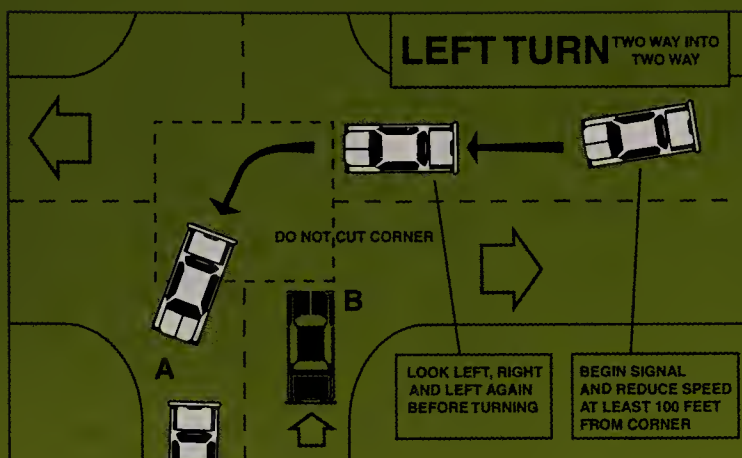
Hope for the Future

MANY CIOs HAVE TRIED STOP-GAP measures such as cost-containment and information standardization, but if a lasting remedy is to be found, a majority believe it will be found down the road, on the internet. Indeed, technologists and administrators alike see web-enabled electronic medical records (EMR) systems as the holy grail of health-care IT. These systems standardize patient information by digitizing every page in a patient's file, from old prescriptions to height and weight charts.



Providence Health System CIO **Rick Skinner** has spent more than \$8 million on electronic medical records since 1994 and plans to spend another \$2 million this year.

PHOTO BY TIM JEWETT



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CIOs say that with all patient records in one web-accessible format, disparate standardization efforts will be a thing of the past. Rather than employ dozens of efforts to standardize dozens of different data sets, EMR will let health-care technologists invest in only one. What's more, experts say that by 2010, EMR will replace paper records entirely, saving the industry hundreds of millions of dollars every year in clerical staffing costs.

The technology also answers the call for increased customer service, since patients can access personal information online. Because EMR files are based on extensible markup language, doctors and patients can view records from any browser, on dynamically generated webpages. People on the payer side can use them too; after stripping the information of its HTML tags, technicians can plug it into pre-existing financial systems as raw data.

"Talk about flexibility," says Mary Paul, CIO at Milwaukee-based Columbia St. Mary's Inc. "EMR could change everything.

year. The payoff? Total automation. Physicians at any of Providence's seven hospitals in Oregon can access a chart or document from any patient's file at any time. With internet access and the right passwords, doctors can even access these files from home, say, in an emergency in the middle of the night.

Skinner says he's already seen the system pay huge dividends. At a time when most health-care systems in the Pacific Northwest are shrinking, Providence is growing each year. Costs are down, profit margins are up, and Skinner says his IT budget has risen steadily over the last two years. "EMR is where the industry is going," he says. "By getting a head start, we really put ourselves in great shape for the future."

EMR, however, is just the beginning of the internet revolution in the health-care industry. What really excites health-care CIOs is e-health, the insider term for web-based health care. CIOs across the industry say they've set aside money to expand their websites, hoping that programmers can build

expensive to implement and they have no confidence that the price will ever come down significantly. Other CIOs, particularly technologists at large health systems and HMOs, say they're worried about patient privacy once the records go online. At conferences and association meetings all over the industry, these technologists are trying to figure out how to increase security without compromising performance or access to information.

The Penny-Wise Present

STILL, MOST CIOs AGREE THAT WIDESPREAD adoption of EMR and e-health is at best about 10 years off. For a majority of CIOs, these options sit on the back burner while they address more pressing issues. Perhaps the biggest of these is cost containment. Business and clinical systems for health-care organizations cost big bucks, and because most organizations are so big, systems that cost millions to buy cost nearly as much to maintain. With reimbursements at an all-time low, CIOs have found that the best way to pay for the new stuff they need while maintaining what they already have is to be tight.

At Baptist Health System in Birmingham, Ala., CIO Charles Jones asks his IT managers to report on the state of every system in the organization. If they cost too much to support, Jones says he'll do what he can to scale them down. If his managers discover underutilized systems, he says he'll try to consolidate them or eliminate them and redirect the savings toward other projects.

And forget costly best-of-breed procurement strategies. Partnerships are in; comparison shopping is out. After years of using as many as eight different vendors for core applications, Peter Strombom, CIO at Meriter Health Services in Madison, Wis., recently decided to partner with 3M, HBOC, and GEAC Computer Corp. of Markham, Ontario. The results, he says, have been good. This year, by leveraging the volume and size of his organization, Strombom esti-

"EMR is where the industry is going. By getting a head start, we really put ourselves in great shape for the future."

—Rick Skinner, CIO, Providence Health System

We'll be able to access the information online and be able to plug it into any of the systems or databases we already have. It won't fully resolve health-care computing issues, but it will certainly better support patient care and should make our lives as technologists a lot easier."

Some health-care organizations have already started the switch to EMR. At Providence Health System in Portland, Ore., CIO Rick Skinner partnered with a local software developer to build an EMR system for the organization's ambulatory patients. Skinner says that since 1994 he's spent more than \$8 million on the system and adds that he plans to spend another \$2 million on it this

dynamic applications that will enable patients to schedule appointments, submit insurance information and fulfill prescriptions from their living rooms. A number of health-care CIOs have even signed up for services such as WebMD, Healthvision and eMD.com, all of which link patients, payers and providers in privately funded, virtual environments. Meanwhile, some of the biggest health insurers are reportedly developing their own online project, according to *The New York Times*.

But even EMR and e-health cannot be described as magic bullets to cure our sick health-care system. CIOs at smaller hospitals say that these technologies are still far too

A photograph of a laptop with a broken CD-ROM tray. A drink is spilled from the tray, creating a large splash. The text 'GEEZ, JAMIE. WHERE'D YOU GET THESE CRAPPO CUPHOLDERS?' is overlaid on the image.

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At Methodist Hospitals of Dallas, Vice President of Systems and CIO Pamela McNutt has implemented standards of her own for clinical data.

growing wildly, with no plans to integrate systems or to make sure data is compatible," says Christopher Caton, first vice president at Robert W. Baird, an investment bank in Milwaukee. Caton, who covers the health-care industry from an investment point of view, says that from an IT perspective, large organizations, like large ships, can be hard to steer. "Growth itself isn't a problem," he says. "It's the way these organizations incorporate that growth."

Growth yields disparate systems, and disparate systems yield disparate data. Many CIOs say the key to integrating these systems seamlessly is making sure the data they contain is as similar as possible. Standardization is the linchpin of enterprisewide computing, and these broad systems are the technological tools CIOs expect to alter the financial environment while they wait for e-health to catch on. For most health-care CIOs, the logic is simple: Without standardization, there can be no ERP. As a result, most health-care technologists conform to data standards established by the federal Health Level 7 (HL7) guidelines. These standards require organizations to use a formalized methodology that involves an object-

oriented data model that provides a consistent view of the data being moved, as well as a view of the data's relationship to other data in business and clinical systems across the enterprise. The model ensures that all data is consistent and "usable" to applications

even remotely involved in the data exchange. At Methodist Hospitals of Dallas, Vice President of Systems and CIO Pamela McNutt has taken these standards to another level. She has added standards of her own to some of the clinical data exchanged between facilities. Early last year, McNutt

"The key is to improve quality of care while saving money. With these new standards in IT, we're hoping to do just that."

—Pamela McNutt, CIO, Methodist Hospitals of Dallas

mates he may save as much as \$1 million in pricing deals alone.

In order to contain costs, however, you first have to know what they are. Surprisingly enough, that's not always easy. Case in point: Harvard Pilgrim. After acquiring a number of smaller health-care organizations in the

early '90s, Harvard Pilgrim never bothered to integrate their separate billing systems, causing it to grossly miscalculate its losses. As health-care organizations continue to grow in size, standardization and integration will become increasingly important.

"A lot of health-care organizations are

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installed a clinical documentation system to help nurses streamline the process of charting changes in patients. By selecting the conditions that apply to each patient on a formatted screen on desktop computers, nurses automated records that used to be filed in a free-form fashion. The new standards have enabled physicians at Methodist's main facility in Dallas to exchange case-sensitive information instantly with caregivers at the organization's secondary facility in nearby Duncanville. In emergencies, or in cases where a particular diagnosis is difficult, doctors appreciate this flexibility.

"We're always trying to use technology to improve quality of care, but with the way

health care is today, that's only part of the picture," McNutt says. "The key is to improve quality of care while saving money. With these new standards in IT, we're hoping to do just that."

Physicians rely on similar standards-based systems at Rush Presbyterian St. Luke's Medical Center in Chicago. Doctors enter medical results into a 3M clinical data repository. Separately, they are developing a system where financial data will be entered into an Oracle-based system and proprietary software will mine it for similarities and patterns in care. Every treatment has a code, and every code corresponds to a particular level of cost of care and outcomes. CIO Pat Skarulis

hopes to use this system to produce report cards that notify doctors working in the same field how much money they're spending on patients who have similar illnesses. Skarulis insists that these report cards will make doctors more aware of how much they spend to treat their patients, but more important, the cards will notify doctors on how their treatment plans compare with those of their colleagues where it's appropriate.

Medical ethicists, however, say the strategy could force doctors to choose the least-expensive treatments to keep costs down. "While physicians should be conscious of costs and not provide or prescribe unnecessary services, concern for the quality of care

The New Rules

If you thought Y2K remediation was expensive, get a load of the new HIPAA regs

Health-care executives estimate that they spent a combined \$8.5 billion on Y2K. Those same executives say they could spend four times that much complying with the Health Insurance Portability and Accountability Act of 1996. HIPAA compels hospitals, health plans and other health-care providers to reconfigure patient records into an electronic format by 2002. The intent is to standardize data across the industry and make patient information transferable and accessible over the internet.

The Health Care Finance Administration (HCFA), which first issued draft regulations in mid-1998, predicts the health-care industry will save \$1.5 billion during the first five years of HIPAA implementation, mostly in switching from paper to electronic claims submission. Health-care CIOs, however, predict these overhauls could make the billions they spent on Y2K seem like lunch money.

"There's no telling what this will cost us," says Shyam Heda, CIO at 280,000-member Promina Health System in Atlanta. "All we know is that it will be substantial."

To comply, health-care CIOs must:

- Embed 10-digit numbers and additional identification codes for each patient into systems across the network. These numbers will act as identifiers during data exchanges.
- Follow uniform information protocols for exchanging patient information.
- Establish a multifaceted security process to ensure confidentiality and privacy of patient records.

To prepare for these changes, many technologists are taking the same approach they took for Y2K. CIOs have formed exploratory committees, and many have already spent \$1 million to \$2 million on initial compliance attempts. At Baptist St. Vincent's in Jacksonville, Fla., CIO Warren Chandler has assigned one of his managers as Health Information Security Officer to monitor and prepare for any necessary regulation requirements. While Chandler says he's a little worried about what HIPAA might cost him, he insists that any changes the law requires will be changes for the better.

"Unless it's followed to a ridiculous extreme, HIPAA looks like it will do nothing but mandate commonsense management nationwide," says Chandler, whose organization includes more than 30 facilities in Northeast Florida. "So long as health-care CIOs run a tight ship now, compliance shouldn't be that tough at all."

Still, other CIOs aren't convinced. "Organizations using software they're not keeping current could wind up with a fairly significant challenge," says Rick Skinner, CIO at Providence Health System in Portland, Ore. "There are going to be institutions devastated by this law."

The HCFA is scheduled to complete its HIPAA regulations by the middle of 2001, and the law could go into effect as soon as 2002. Failure to comply could cost health-care executives anywhere from \$100 to \$25,000 per offense. Furthermore, individuals who knowingly violate the law's patient-confidentiality provisions could face 10 years in prison and a \$250,000 fine.

—M. Villano



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the patient receives should be the physician's first consideration," says Dr. Thomas R. Reardon, president of the American Medical Association and a general practitioner at the Portland (Ore.) Adventist Hospital. "If [Rush] uses the system for information and education, that's one thing. If they use it to force cheap treatments, that's unethical."

remained within budget and according to standards.

So far, Glaser says, results have been mixed. While the IT departments at the individual hospitals have thrown millions of dollars into an enterprisewide provider order-entry system, they decided to reduce funds for EMR and not fund e-health, which

Glaser believes to be the best long-term hope for fixing what's wrong. Glaser understands that his IT managers are so focused on meeting the challenges of today that they sometimes lose sight of the value of projects that will help the hospital over time, and that's why he retains control over 10 percent of Partners' annual IT budget, which is dedi-

cated to corporate initiatives.

He says he plans to spend this money on the computerized records and website enhancements his colleagues did not.

"Accountability is important," says Glaser, who wrote *The Strategic Application of Information Technology in Healthcare Organizations* (McGraw Hill, 1999). "But in this case, the future of IT at

"We were looking for a way to continue the excellence we were providing in a more cost-effective way...to standardize our equipment and our data...and to hire and keep good people. In one fell swoop, we managed to do all three."

—Guy Scalzi, vice president, First Consulting Group Management Services

Other Solutions

HOWEVER EXPERTS VIEW SKARULIS'S approach, one thing is clear: As a CIO, Skarulis took matters into her own hands. Other technologists have taken a more laissez-faire approach.

After years of managing IT for nine institutions, John Glaser, vice president and CIO at Partners HealthCare System in Boston, recently decided to delegate more budgetary responsibilities among his constituents. Not every hospital in the Partners network needed the same technology, and Glaser hoped that by placing accountability for IT investments in the hands of the people who would use them most, he could keep costs down and maximize efficiency. For the last couple of years, his IT managers at institutions such as Brigham and Women's Hospital and Massachusetts General Hospital have had almost total control over areas such as procurement and hiring as long as they've

Guy Scalzi has tried to meet the challenges of health-care IT by handing over all of New York Presbyterian Health Care's IT responsibilities to First Consulting Group.

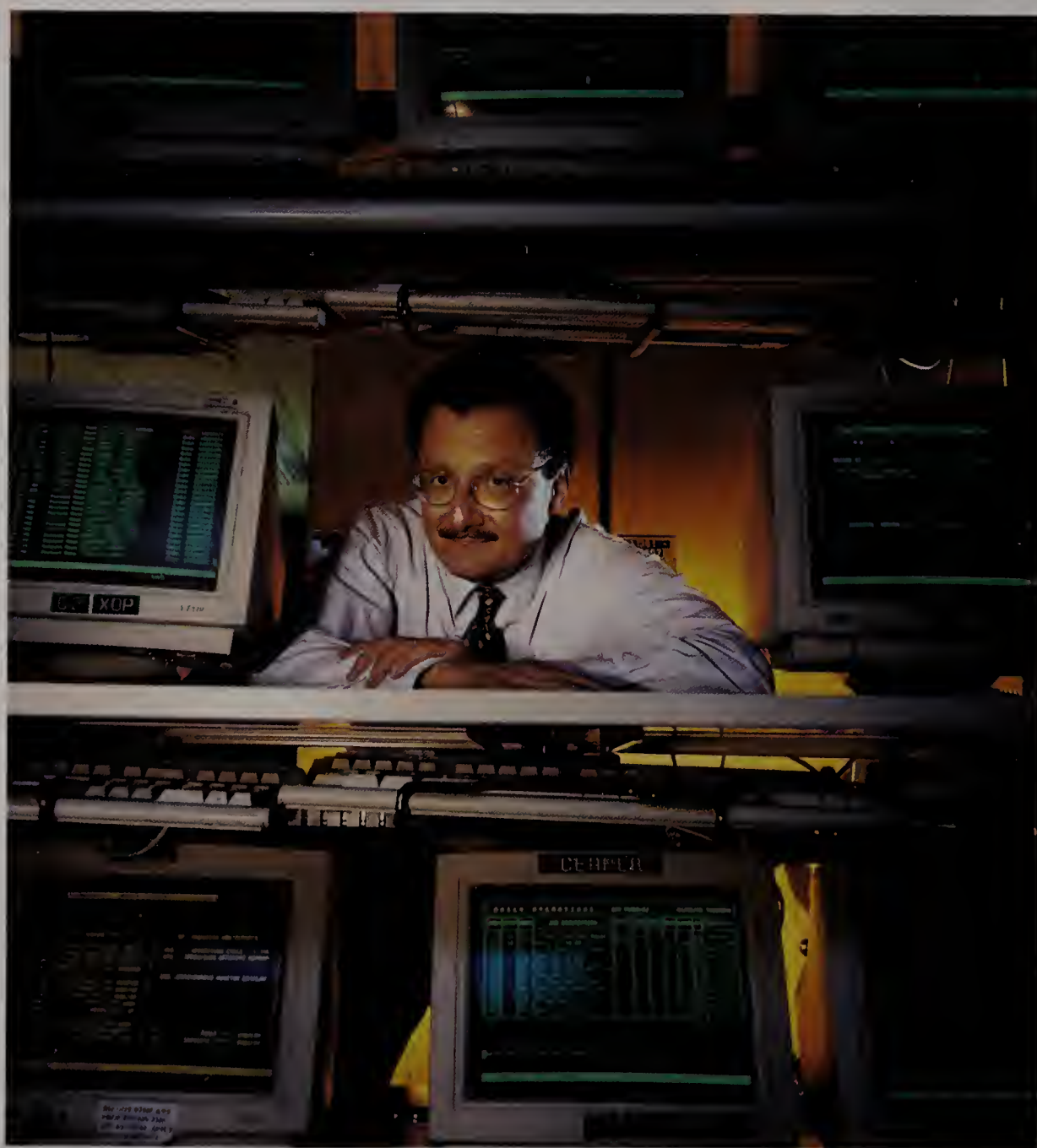


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our organization takes precedence.”

At New York Presbyterian Health Care in New York City, Guy Scalzi has tried to meet the challenges of health-care IT by handing over all of the organization's IT responsibilities to First Consulting Group (FCG) in Long Beach, Calif. The seven-year, \$228 million arrangement came in late 1999, a little less than a year after Columbia Presbyterian Medical Center merged with New York Cornell Hospital. This, however, was no ordinary outsourcing deal. Concerned about maximizing a return on his investment, Scalzi requested a partnership in which Presbyterian could hedge its risk by sharing resources and profits. FCG responded by setting up a new subsidiary called FCG Management Services (FCGMS) to handle Presbyterian's outsourced IT and giving the health system 15 percent ownership.

Once the subsidiary was formed, FCG had to staff it. Hospital administrators didn't want to work with an IT department of

outsourcing deal. At FCGMS, however, Scalzi and his employees are experiencing what one employee calls a “renaissance.” Under the agreement, they had an opportunity for better salaries, stock options and better access to IT professions and colleagues within the industry. What's more, Scalzi says, the subsidiary plans to offer training programs for some of its newest people and has already pledged \$6 million to rework the hospital's help desk, work on service-level agreements and reengineer its network.

“This deal was a win-win for everyone involved,” says Scalzi. “We were looking for a way to continue the excellence we were providing and do it in a more cost-effective way. We were looking for a way to standardize our equipment and our data. We were looking for a way to hire and keep good people. In one fell swoop, we managed to do all [three].”

Analysts give the arrangement two thumbs up, saying that similar risk-management relationships could be beneficial for

and allows hospitals to manage patient care and use IT as the tool it is designed to be.”

Waiting for E-Health

REGARDLESS OF HOW CIOs CHOOSE to address the challenges brought about by managed care, most believe that anything short of EMR or e-health is just an interim measure. Statistics show that merger mania in the health-care industry is slowing down; as a result, more CIOs should be free to launch implementation efforts in these areas over the next few months. Still, with Health Insurance Portability and Accountability Act regulations on the way (see “The New Rules,” Page 176) and the prospect of the new president overhauling the health-care industry entirely, experts predict CIOs won't adopt EMR systems or web-based health care on a widespread scale before 2010.

“So much of it is out of our hands,” Partners' Glaser says. “We do what we can, but we're basically just waiting for EMR and e-health to change everything.”

Until these sophisticated technologies arrive, experts say the burden of extending the life of the nation's health-care system lies squarely on CIOs.

“Patients want to do more of their medical management from home, doctors want to provide care quickly and efficiently, and hospitals and HMOs want to keep costs down,” says Jim Gabler, a research director for GartnerGroup's Healthcare Industry Research and Advisory Services in Stamford, Conn. “All of this relates to technology, and it's up to CIOs to find a better way. People say health care revolves around doctors and patient care. Well in the months and years to come, the industry will revolve around technology and the CIO.” **CIO**

Do you think IT can solve health care's woes? Let us know at letters@cio.com. Matt Villano, a freelance writer based in New York City, can be reached at mjv@whalehead.com.

Until these sophisticated technologies arrive, experts say the burden of extending the life of the nation's health-care system lies squarely on CIOs.

strangers, so they convinced FCG to hire all of the IT employees from Columbia and Cornell. Scalzi himself left his post as CIO at Presbyterian to become vice president at FCGMS. Since November, more than 400 of the 450 IT employees he had at Presbyterian have followed him. Scalzi says that none of his employees was laid off, and that the switch enabled him to eliminate almost 50 vacancies he had had when the two hospitals merged. Better still, rather than outsourcing to an organization of people with no experience in health care, Scalzi chose to work with people he knows, likes and trusts.

Today Presbyterian keeps an IT staff of eight. These employees are mostly clerical and spend much of their time managing the

large health systems all over the country. In particular, these experts applaud the fact that the Presbyterian-FCG deal sets up a guaranteed return on investment by giving the hospital equity in a subsidiary. Though some experts wonder whether this business relationship will put cost-containment ahead of care, Caton, the analyst who covers health care for Robert W. Baird, describes the deal as ingenious and says it enables each entity to do what it does best.

“It's like they're saying, ‘We know we have to increase our budgets for IT and we don't have the expertise or resources to do it, so let's look for someone who does,’” he says. “In essence, the relationship brings in a consultant to worry about the heavy stuff

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The End Hit of the Parade

Trying to figure out whether your website needs a redesign? Stop measuring hits and start measuring customer experience.

BY RAMIN JALESHGARI

AN AD MAKING THE ROUNDS on the radio airwaves has a guy touting a new website called iClock. "It tells the time," he enthuses, trying to sell a friend on investing in the venture. "Ticktock, baby."

The ad is a parody of dotcom hype. But part of its humor lies in the fact that it gets at a deeper truth: Once upon a time, if it was on the web, it was good. If it did tricks, so much the

Reader ROI

- ▶ Learn if you are meeting customer needs
- ▶ Find out how to glean insight from customer interviews and surveys
- ▶ See how to use website data analysis



American Leather VP of Marketing and Sales **Cary Benson** used customer surveys to help chart the course of his site redesign.

Whole Foods Inc., careful tracking of customer responses to an e-mail newsletter revealed the need for a new website. And at online learning site Hungry Minds, analyzing users' movements revealed the potential for lucrative partnership deals.

Investing any more money in your website without evaluating how well it meets the customers' needs—or whether it is delivering enough of an ROI to justify its existence—is about as stupid as investing in a website that tells the time. This story will give you tips on how to measure whether your website measures up.

CLOCKING Customer Satisfaction

Getting into the mind of the internet consumer is a job not just for the CIO. Marketing and IT must come together; indeed, the entire executive team needs to get involved. Creative Good, a customer-experience-focused internet consulting company in New York City, uses "listening labs" to help clients through this process. In the labs, Creative Good employees conduct one-on-

one interviews with a typical website user. Creative Good Founder and President Mark Hurst favors the one-on-one approach over large focus groups. "A big group feeds off each other," Hurst says. Rather than leading users through sites by asking specific questions, Creative Good interviewers ask users to simply navigate the site as they would at home and talk about what they are doing. "We get a lot more truth about a site's efficacy that way," Hurst says. "That will lead to a better redesign process."

User surveys are another way to find out what your customers want—and they can help a company put a personal strategic spin on industrywide research. American Leather used both industry research and a customer survey to carve out its web strategy. Furniture industry research showed that buyers still want to feel how easy an easy chair is before they buy it; the research also showed that furniture websites have far higher return rates than American Leather's own .03 percent return rate from its brick-and-mortar retailers. Given that research, it simply didn't make sense for the manufacturer to sell direct over the web and undercut its distributors. "[It] would not be profitable for us because each piece is custom-made and not easily resaleable," says Cary Benson, American Leather's vice president of sales and marketing.

better. And how did a company know if its website was really good? Of course, by measuring traffic. The more traffic, the better, right?

Well, if you're still just counting hits to gauge the success of your company's site, ticktock, baby—it's probably time for a redesign. Chances are good that your site isn't really delivering what your customers want and isn't giving your company a return on its web investment.

Why? According to Forrester Research, many companies still use hits as the primary measurement of website success, followed by page views and session length (see "Measures Minus Insight," Page 188). Yet few companies make good use of this basic server data. They don't know how to slice it and dice it, and even if they do, the information they glean is often too simplistic: Hit levels alone can't demonstrate customer loyalty or satisfaction, nor can they tell a company whether its website has helped reduce costs or bring in new business.

If measuring hits can't tell you how your website is doing or how to improve it, what can? At furniture maker American Leather, customer surveys showed the company how it could use its website to play a role in a furniture shopping excursion—without alienating its dealers. At natural foods and wellness products retailer



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American Leather's survey of its own customers revealed that they wanted a website with product information so that they could do research online. "That way they could come to our site and really spec out what they wanted before they went to a retail outlet to buy," Benson says. That led American Leather to add a dealer locator

queries and requests for more information triggered by the Wholefoods.com newsletter also revealed that customers wanted to be able to e-mail articles on the site to someone else. They also wanted personalized content and collaborative filtering—that is, when looking at item X, they wanted to know that other people who bought item X bought items Y and Z to go with it.

At Wholefoods.com, the rate at which new customers came to the site and bought goods skyrocketed following the mailing of the newsletter.

online. Future site improvements in the works include adding a room planning tool and a tool for checking the production status of furniture ordered through a retail store. But the company seems to already be reaping some benefits from the dealer locator and expanded product information, Benson says. In 1999, furniture shipments rose 42 percent, which Benson credits in part to the website; many retailers have told him that customers learned about the company via a magazine ad that listed the website as a way to get more information.

MINING E-MAIL and Visitor Trails

Interviews and surveys aren't the only ways to figure out what customers want from your website. At Wholefoods.com, Whole Foods' online store, tracking customer responses to a monthly e-mail newsletter sparked the idea for a new website. The monthly newsletter contained health alerts as well as information on laws relating to whole foods and health care. The rate at which new customers came to the site and bought goods skyrocketed following the mailing of the newsletter. "We realized we could develop a whole site based on providing this kind of information," says John Fischer, director of internet marketing at Wholepeople.com, the new site that, in addition to selling natural products, offers information on health-care protocols that combine alternative and traditional medicine. Customer

his team analyzed the way users jumped between pages. They tracked user actions at the page-view level and plugged that data into a business intelligence system that was able to create "what if" scenarios. "We might see that a lot more people jump from music classes to books about music than vice versa," says Schaefer. "What we then do with that information is develop a relationship with a partner that sells music on the web and create a jump from our page to their page."

*During Hungry Minds' redesign, a business intelligence program showed CTO **Bill Schaefer** the way to develop new partnerships.*



PHOTO BY KENT HANSON



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Advanced data warehousing and data mining tools can cross-reference website data in multiple dimensions, helping companies get a broader picture of customer activity, says Lou Agosta, a senior analyst at Giga Information Group. "Data warehouses allow you to take transactional data from e-commerce sites and aggregate it in such a way to see which brands are hot and what customers are looking for," Agosta says. Knowing which customers are buying what—and when they are buying it—allows a company to better manage the physical flow of products and better manage fulfillment. That, in turn, can help them cut costs and maximize efficiency—numbers that will help demonstrate a site's ROI.

Data mining tools can be difficult to use, Agosta says, requiring a high level of analytical proficiency. Companies that don't have the expertise or resources in-house can outsource the job to marketing services integrators, according to Forrester Research's "Measuring Web Success" report. Some vendors offer turnkey packages, while other vendors charge monthly fees; costs range from as low as \$15,000 a year to \$200,000 a year and beyond. But Forrester's report states that any company that wants to be an e-commerce leader should develop an in-house "web intelligence" infrastructure—that is, a way to aggregate, store and distribute website intelligence throughout the company; expect to spend well into six figures for products and systems integration help. The rewards will be greater than just being able to measure whether a website is successful, the report notes; good website intelligence will help a company develop better site personalization, more targeted marketing, hotter sales leads and stronger partnerships with other e-commerce players.

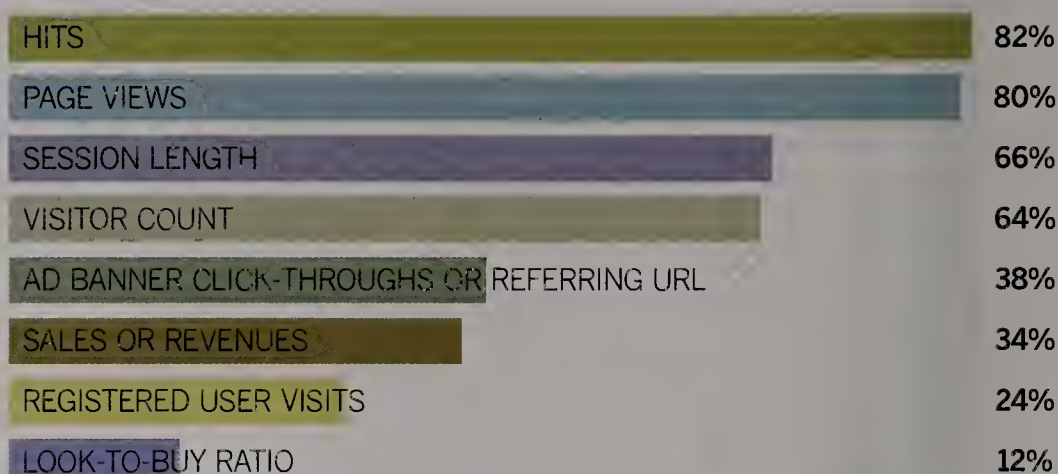
E-commerce leaders should develop an **in-house "web intelligence" infrastructure;** expect to spend well into six **figures** for **products** and systems integration help.

REMEMBERING the Basics

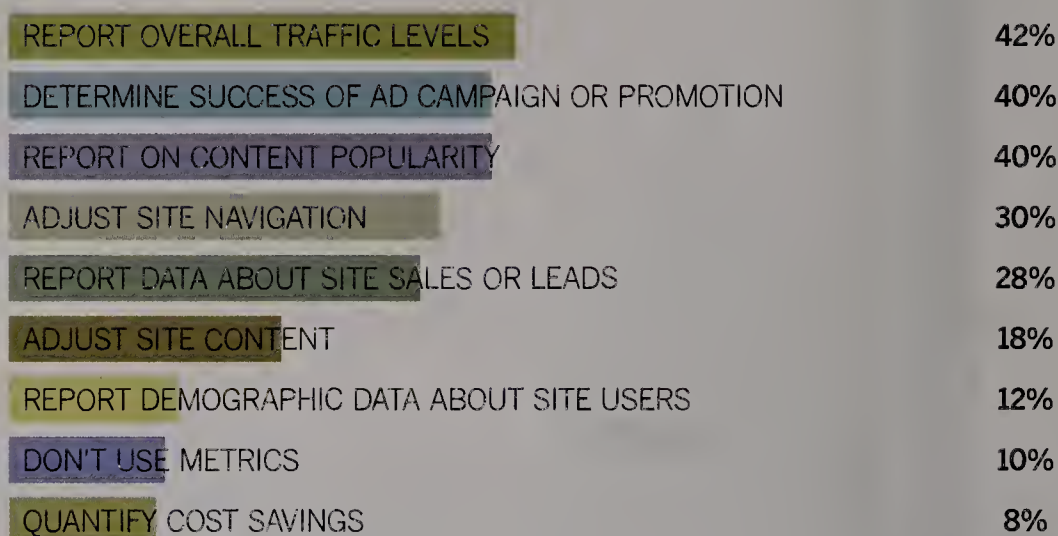
Even so, Creative Good's Hurst notes that pricey software isn't a magic bullet. Indeed, companies sometimes make the mistake of buying elaborate software packages that analyze data a million ways, and then

Measures **Minus** Insight

What metrics do you use to measure your website's success?



How do you use the metrics?



SOURCE: "MEASURING WEB SUCCESS," FORRESTER RESEARCH, CAMBRIDGE, MASS., NOVEMBER 1999. PERCENTAGE OF 50 GLOBAL 2,500 COMPANIES INTERVIEWED; MULTIPLE RESPONSES ACCEPTED.

neglect to look at the most basic, day-to-day measurements of how a site is doing in its primary function: promoting business. For an e-commerce site, those basic measurements are conversion rate—that is, the ratio of buyers to visitors—and average order size. For sites that

make money via advertising banners, they should measure the number of ad banners viewed; other sites can measure traffic from return visitors versus traffic from new visitors.

Once a company has settled on the simple measurements that matter most, Hurst says, it must make sure that everyone in the organization who works on the website is

aware of those numbers—every day. "This should be a simple task too," Hurst says. "A daily e-mail is just fine." The e-mail should contain a short list in bulleted form stating the key measurements and highlighting any changes; a drop in conversion rates or order size could



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AltaVista's VP of Marketing **Charles**

Rashall says performance was a priority during the portal's redesign.

be a red flag about more serious problems with the site.

And beyond these numbers, experts say, companies would do well to remember one of the most basic elements of delivering a good customer experience: making sure that pages load quickly, even when the site is barraged with traffic. Performance was a key consideration for web portal AltaVista when it underwent a redesign last year to add e-commerce, live chat, real-time news feeds and stock quotes, among other features, says Charles Rashall, the company's vice president of marketing. To make sure the new additions wouldn't drag down site performance, Rashall says, AltaVista increased its server space to 23 terabytes—enough to store a copy of the entire internet.

Most companies can't afford to power up their server farms to portal strength, however. So Steve Telleen, managing director of Giga Information Group's Website ScoreCard, advises companies to avoid using flashy technologies that eat up server space and slow down page loading times, such as unnecessary streaming video or audio, or "virtual" room models.

Even the most basic technology and design decisions can sour a



link navigation—users will be lost. "They have no idea where to navigate," Telleen says. "That is a surefire way to lose customers." At beer-brewer Heineken's site, he says, the lack of text navigation in the slow-to-load company store would make it impossible

to buy a product should the images fail to load.

Above all, companies embarking on a redesign must remember the age-old exhortation to keep it simple. "Increasingly web developers are enamored of special effects and forgo the kind of simplicity that's key for a good customer

experience," says Telleen. "Consumers come to the web for ease of use. Take that away from them and they're not coming back." **CIO**

Does your website measure up? Senior Editor Sari Kalin would like to know; e-mail her at skalin@cio.com. Ramin Jaleshgari, a New York City-based freelancer, can be reached at ramin@mindspring.com.

Most companies can't afford to **power** up their
server farms to **portal** strength. So avoid using
flashy graphics that eat up **server** space
and slow down page **loading** times.

customer's experience. Formatting content in such a way that it can't be viewed by earlier versions of a web browser can be a real turnoff for customers who have yet to upgrade to the latest version. Another design faux pas is using images and icons for navigation without offering plain hypertext links. Images may look snazzy, but if they don't load properly—and there's no backup hypertext

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Learning to Lead

Your lack of leadership skills may be hindering the development of your knowledge workers. A new book aims to help.

BY DAVID A. GARVIN

Creating a learning organization sounds good in theory. Try to find an executive who wouldn't like more collaborative, innovative and knowledgeable workers, and a backbone of clearly defined, cost-cutting best practices. But putting the learning organization theory into practice is difficult—especially when it comes to leading this type of sweeping enterprise-wide change. So how does one even begin creating the learning organization?

In his new book, *Learning in Action: A Guide to Putting the Learning Organization to Work*, Harvard Business School Professor David A. Garvin examines the challenges facing executives as they move toward creating and sustaining the learning organization, and offers real-world techniques and

ILLUSTRATION BY PHILLIPE WEISBECKER





tools to help managers implement these new processes. Though Garvin notes acceptance of the learning organization model has been high, progress toward achieving the end has been slow. "Learning organizations have been embraced in theory but are still surprisingly rare." What to do? "If executives hope to build learning organizations, they too must become more open to divergent views, more aware of their personal biases and more comfortable with raw, unfiltered data. "Otherwise," Garvin explains, "they will never be able to lead others in learning."

Today managers and leaders are considered to be very different. Managers are action oriented; they spend their days doing, delegating and deciding. Their eyes are on the present, and they measure success by skilled execution and effective implementation. Consistency and stability are the primary goals.

Leaders, on the other hand, focus on the future; they spend their time setting targets, developing strategies, communicating vision and aligning individuals and departments. Change is the primary objective, and the challenge is to get all parts of the organization moving in the desired direction at a rapid enough rate. Clearly, companies need both managers and leaders to succeed, for together they ensure attention to both short- and long-term goals.

Yet enduring success requires that both groups broaden their horizons. Both need to add a new goal, "improving organizational learning," to their already lengthy agendas. Superior intelligence gathering, experiential learning and experimentation are all required. Otherwise, atrophy and drift are inevitable. The challenge is great and becomes ever more pressing with time.

It is for this reason that learning is the key to long-term survival and growth, and that organizational effectiveness is so intimately linked to adaptability and flexibility.

Scholars have responded to the need for

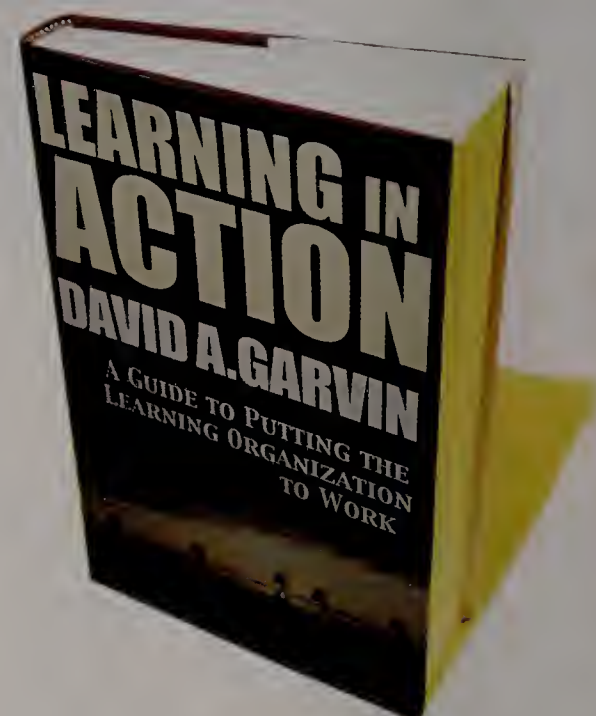
adaptable, flexible learning organizations by suggesting that executives devote more of their time to teaching. As one expert put it: "An organization cannot become a learning organization without first becoming a 'teaching' organization." To that end, executives are urged to share their distinctive perspectives about their companies' strategies, purposes and values. They are told to develop a "teachable point of view" that captivates and enlightens, communicating it to employees through stories and parables. They are instructed to lead management development sessions in which they share their own successes and failures and diffuse their favored approaches throughout the organization. Such prominent CEOs as Roger Enrico of PepsiCo, Jacques Nasser of Ford and Andy Grove of Intel have taken up this challenge, spending weeks of their time in face-to-face meetings with direct reports and other high-potential managers. There, they tell war stories, describe their personal philosophies and teach others to use their favorite tools and techniques.

Teaching and Learning

Teaching puts the instructor front and center. Concepts and ideas flow from the top down or the center out, and the

focus is on knowledge transfer. Teachers are the experts; their role is to deliver content, communicate clear messages and instill better ways of working. Students are regarded as novices; their role is to absorb and accept. The effectiveness of the process is usually measured by the degree to which important information makes the trip from the first group to the second without distortion or loss.

A process designed to foster learning is quite different. New ways of thinking become the desired ends, not facts or frameworks. Discussion and debate replace *ex cathedra* pronouncements. Questions become as important as answers. And success, to use a currently popular phrase, is measured by the degree to which students "learn how to learn." Because the focus shifts from transferring knowledge to developing organizational skills and capabilities, executives' roles must change as well. They become shepherds of learning, responsible for creating supportive environments, probing for insights and deeper thinking and constructing settings where employees can collect,



Learning in Action: A Guide to Putting the Learning Organization to Work

By David A. Garvin
Harvard Business
School Press, \$29.95
April 2000



I am data.

And I am a challenge.

I confound the Chairman,
confuse the co-worker,
and mystify all mere visitors
to the digital domain.

But some know
that with this science
comes this security
for Chairman and co-worker alike:
I put their progress first.

Does anybody put me first?

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interpret and apply information. This, in turn, requires a significant shift in mind-set and attitudes.

Learning, after all, is simply another organizational process, not all that different from strategy formulation, product development or order fulfillment. Like other processes, it unfolds over time, has inputs and outputs, involves diverse departments and levels, and consists of interconnected activities and steps. And like other processes, it must be crafted and led. The concept of

Creating the Opportunity

Today's managers and employees are inundated with work. They have far too much to do and far too little time to do it. Head counts are down, while workloads continue to rise. Products and services are proliferating, markets are globalizing and technology is forcing radical changes. The pressure to produce is high and unrelenting.

In more formal terms, executives must shift from a pure performance orientation—in which results are all that matter—to one that balances performance and learning goals.

a “process owner” is as relevant to intelligence gathering, experiential learning and experimentation as it is to better-known operational and business processes—and for many of the same reasons: lack of attention, diffused responsibility, fragmentation and inefficiency. According to one expert on reengineering: “Why did we design inefficient processes? In a way, we didn’t. Many of our procedures were not designed at all; they just happened.”

There are three primary tasks to developing the learning organization. First, leaders and managers must create opportunities for learning by designing settings and events that prompt the necessary activities. Second, they must cultivate the proper tone, fostering desirable norms, behaviors and rules of engagement. Third, they must personally lead the process of discussion, framing the debate, posing questions, listening attentively, and providing feedback and closure. Done properly, these three tasks go a long way toward building an organization’s enduring capacity for learning.

In such settings, the urgent frequently drives out the important, and learning becomes an unnecessary frill. It is easily postponed in the face of more immediate demands.

To raise its visibility, executives need to create learning forums—assignments, activities and events whose primary purpose is to foster learning. Think, by way of analogy, of the ancient Roman forum, a central gathering place where citizens discussed the great issues of the day. Organizations are equally in need of public and private settings where they can wrestle collectively with difficult questions.

Learning forums can take many other forms. They include systems audits, which review the health of large, cross-functional processes and delivery systems; internal benchmarking projects, which identify and compare best-in-class activities within an organization; and study missions, which dispatch employees to leading organizations around the world to better understand their performance and distinctive skills.

In more formal terms, executives must

shift from a pure performance orientation—in which results are all that matter—to one that balances performance and learning goals. According to scholars, when people find themselves in settings such as the classroom or the workplace, they typically display one of two orientations. Some focus primarily on performance; their goal is to gain favorable evaluations from superiors and perform well relative to peers. Others focus primarily on learning; their goal is to increase their competence and skills and develop increased mastery of the task at hand.

While the two orientations are to some degree ingrained, they also reflect the surrounding environment. Psychologists have found that when teachers focus exclusively on results, respond negatively to errors and praise students for their innate abilities, they tend to encourage a performance orientation. When they pay attention to personal development, use errors as opportunities for improvement and praise students for their effort and hard work, they tend to encourage a learning orientation. The analogy to management should be obvious. Just as teachers are responsible for the environments of their classrooms, leaders are responsible for the climates of their organizations. For both short- and long-term success, they must attend to more than results alone. A performance orientation remains vital—otherwise, employees will engage in activity for activity’s sake, with little direction or design—but its impact can be magnified when coupled with efforts to stimulate more of a learning orientation.

Setting the Tone

All of these examples also show the importance of setting the proper tone. Learning is a difficult and delicate process: it will flower only if the climate is right. Participants face considerable uncertainty and risk. Politics and gamesmanship often impede the smooth flow of information. Partisanship can easily derail discussions. Learning, after all, is seldom an unmixed

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blessing. There are normally competing interests at stake, and some parties will benefit at the expense of others. Executives must therefore work hard to encourage objective, open-minded inquiry. Otherwise, even the best-designed forums will produce only limited insight.

There are several requirements, however. The atmosphere must be one of challenge, skepticism and doubt, so that easy, pat solutions are not accepted until they have been subjected to careful scrutiny. Participants must feel a sense of security so that they can stretch themselves in new directions without

fear of failure, and incentives must support experimentation and risk taking. A sense of fairness must prevail, with no group feeling that its ideas are getting short shrift. And the rules of engagement must encourage the sharing of knowledge so that information is pooled and becomes common property. Cultivating such climates requires special sensitivities: extraordinary attention to context and tone, the ability to draw people out and a deep familiarity with the forces that drive learning.

This does not mean that executives should strive to create “warm and fuzzy” cultures

that lack tension or pressure. Learning must be channeled and directed; otherwise, “the result is likely to be a series of random walks to personal enlightenment that do little for overall performance.” Ensuring that employees deal with difficult business issues is a vital part of the leader’s role. But challenges must be framed in ways that encourage inquiry and foster a learning orientation. Tough questions can be raised, but they must be framed in ways that draw participants into the problem. Neither stinging critiques nor fiery speeches are necessary. Instead, effective interventions typically take one of three forms: (1) tentative, partially developed proposals that stimulate discussion; (2) novel, unexpected questions that prompt new thinking; or (3) changes in processes and procedures that introduce contrary, dissenting views.

Challenge alone, however, is not enough to guarantee learning. Individuals also need a sense of security if they are to throw off old ways of thinking and acting. Fear of failure creates personal risk and vulnerability; both make it difficult to move forward. Some level of support is therefore required if the process is ever to get off the ground. Here, senior executives play a vital role, for they can personally shape the environment in ways that provide protection and support.

From Organizational to Individual Learning

Without individuals who learn, there can be no learning organizations—they are, of course, essential for success. For executives, the first step in building a learning organization is a personal one: They need to develop these four skills as learners.

1 Openness to new perspectives

Openness requires that leaders accept the provisional nature of knowledge. Even long-established truths must eventually be revised and replaced. To remain current, they must continuously seek out competing concepts and evidence, wrestle with surprising and unfamiliar ideas, and consider new and unpopular points of view.

2 Awareness of personal biases

A second requirement for effective learning is an awareness of one’s personal biases. These biases may appear as distinctive cognitive styles or as pervasive learning disabilities. The former are unique to individuals, while the latter are common to all.

3 Exposure to unfiltered data

Leaders need a greater contact with raw, unfiltered data. Many executives are distressingly detached from the realities of their organizations. They need to tour factories, drop in on service centers, meet with disgruntled employees and talk with customers.

4 A sense of humility

Finally, if they are to progress as learners, leaders need to develop a sense of humility. They must recognize that they do not have all the answers. They must acknowledge that superior insights lie elsewhere—outside their offices, and at times outside their organizations. Learning, after all, is a profession of faith in the future, an admission that progress is possible.

Leading the Discussion

Once leaders have created the desired climate, learning can begin in earnest. Whether the focus is intelligence gathering, or learning from experience or experimentation, some discussion is usually involved. In fact, virtually every example in this book involved intensive discussions at several points along the way. Findings were seldom self-evident. Meaning often had to be constructed, and participants usually found it necessary to engage actively with the material and with one another, debating alternatives until they reached a decision or conclusion.

SOURCE: *LEARNING IN ACTION: A GUIDE TO PUTTING THE LEARNING ORGANIZATION TO WORK*. BY DAVID A. GARVIN (HARVARD BUSINESS SCHOOL PRESS, 2000)



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Such discussions seldom proceed smoothly or of their own accord. They can easily derail, resulting in entrenched positions, superficial debate, finger-pointing, miscommunication and an inability to move forward. For real progress to occur, considerable shaping and direction are required. Someone has to lead the process. Skilled executives recognize that this is one of their primary responsibilities.

Three Keys to Discussion Success

To succeed at this process, executives need skills in three broad areas: questioning, listening and responding. All are tools of effective discussion leaders. And all can be used equally effectively in corporate settings.

Questions, for example, are enormously powerful tools for leading learning. They are the motive and force that gives shape to inquiry. Unfortunately, managers often treat questions as second-class citizens and regard them as a badge of ignorance. They prefer bold assertions and strong statements because they convey a sense of mastery and control. Yet questions are vital for moving groups forward. Good questions get to the heart of a matter; they force deep thinking and reflection. They must therefore be formulated with care and applied with a deft, sensitive touch.

To begin, it is important to recognize that not all questions are alike. They come in many forms and play diverse roles. There is no single best type of question; the preferred form depends on the situation and current needs. Questions can be used to frame issues, offer instructions, solicit information, probe for analysis, draw connections, seek opinions and ratify decisions.

In a similar fashion, questions should be designed to draw out assumptions and ensure that people are talking to one another rather than past each other. Discussions often founder needlessly because of unstated differences in meaning. Especially when groups

span geographies or are composed of members with diverse backgrounds and experiences, even the simplest communication presents a challenge. Common problems include different uses of the same terms and different reference points. Lucent Technologies, for example, had considerable difficulty with a large software development project because programmers in New Jersey and Massachusetts used the word *test* so differently. Lucent is hardly alone. Misinterpretation is distressingly common.

The one thing people tend to take for granted when talking to others is that they understand each other. People often think they disagree when actually they simply are not talking about the same experiences. In such cases they do not draw each other out far enough to realize that, although they are using the same words, they are thinking about different experiences.

Such problems would disappear if discussion leaders, as well as participants, probed more actively for the roots of differing positions. Of course, skilled ques-

tioning is not enough to ensure that discussions are productive. If real learning is to occur, there must also be active listening. The two go hand in hand, like the blades of scissors.

listen for “disconnects” during discussion. Effective communication requires a strong link between source and receiver. But these connections take work, as well as empathy and rapport. Members of a group must be willing to suspend their preconceptions long enough to internalize what others are actually saying. Here, a useful technique for leaders is to insist that participants repeat what they have just heard and then to ask the original speaker to verify that his or her point has been correctly stated. Only after participants have agreed that the message has been heard is debate allowed to begin.

If leaders did no more than ask questions and listen for answers, many discussions would eventually bog down. Executives must also be able to respond—usually, on the spot and in real-time. An issue is raised, an opinion is ventured, an argument breaks out and all eyes turn to the most senior person in the room. How should she react if she hopes to stimulate learning? There are an almost infinite variety of choices and many paths to success. But there are also a few

All too often, managers interrupt before others have finished, short-circuiting the learning process.

Perhaps the most important is practicing patience. All too often, managers interrupt before others have finished, short-circuiting the learning process. They jump to conclusions, assuming that they have understood someone’s position before receiving a full briefing. Or they project so much of their own thinking into the conversation that the original message is lost.

In the same spirit, executives must learn to

practices that should be avoided at all costs because they are extremely damaging.

Two of the most pernicious practices are “depreciation of the learner” and “drowning of the learner.” The former asserts an executive’s superiority by dumping cold water on anyone else’s comments; the latter asserts his expertise by responding to simple queries with prolonged, mind-numbing lectures. In both cases, further contributions are unlikely to be forthcoming. **CIO**

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Sitting on top of the World

BY MERIDITH LEVINSON

No matter how much MIT's Sloan School of Management gives the class of 2001, these young entrepreneurs want more. A snapshot of your future CIOs, CFOs and CEOs.

In their spare time they code Oracle database applications and build websites. They've been surfing the web since there was a web. They're as comfortable with technology as Michael Jordan is with a basketball.

What they're not comfortable with is the idea that the IPO is the TKO of business. They don't believe that hype. What they believe is that a business should provide a product or service that actually benefits people (a radical notion in today's world of Showmethemoney.com).

Meet the class of 2001 at MIT's Sloan School of Management, one of the country's preeminent business schools. The 350 students in this class are your future consultants, internal staff, vendors and bosses. You might already be familiar with some of their predecessors: Hewlett-Packard CEO Carly Fiorina (1989), Boeing CEO Phil Condit (1975) and Citigroup CEO John Reed (1965) are all Sloan grads.

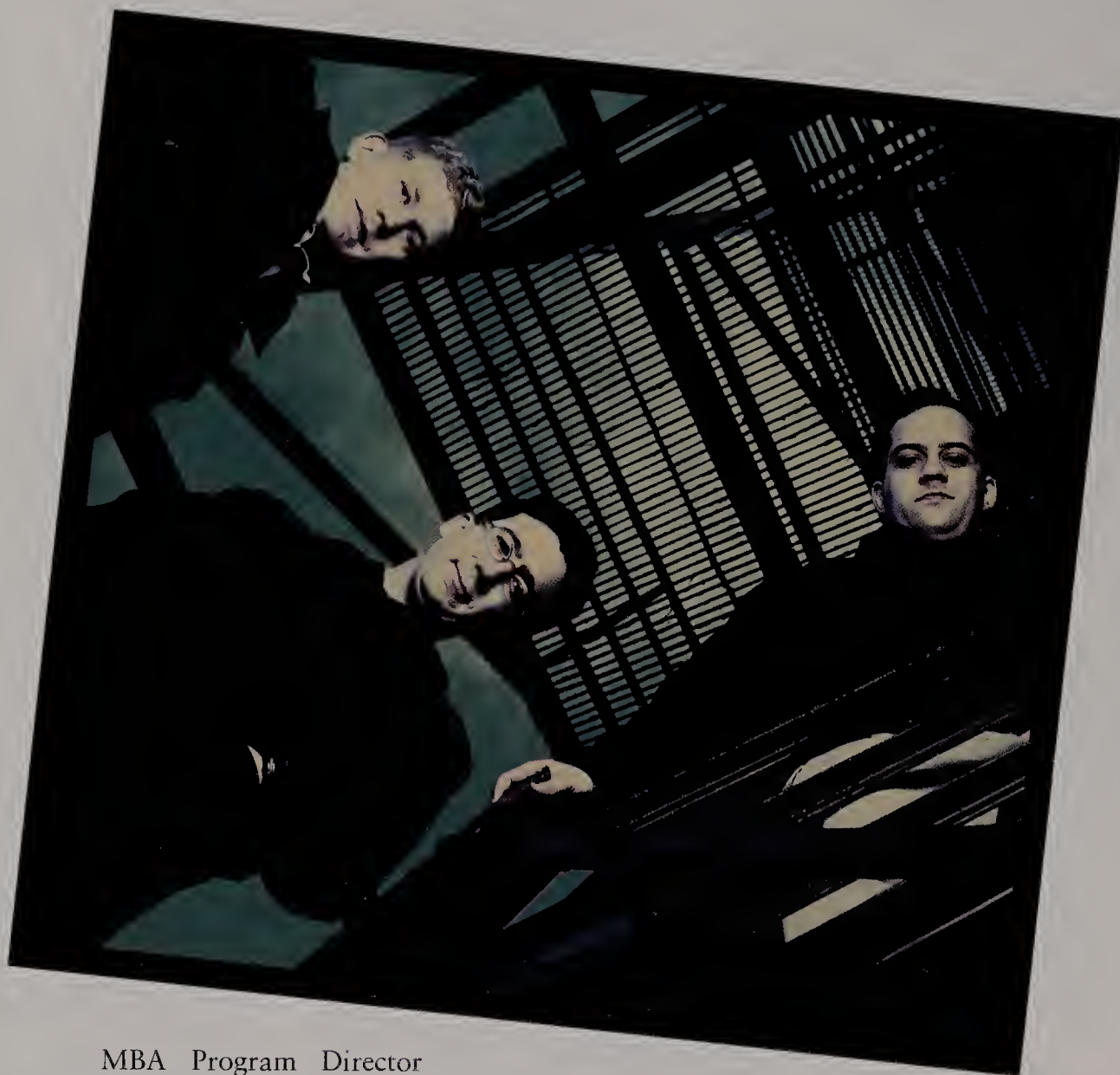
But the class of 2001, which is composed of students from 60 countries (a fact that testifies to the globalization of business and IT), is different. Even their professors admit it. "They don't complain. They don't moan. They don't whimper. They stand and deliver," says Kenneth P. Morse, one of Sloan's high-octane practitioner professors (he cofounded 3Com), who directs its Entrepreneurship Center.

MBA students from the class of 2001 at MIT's Sloan School of Management strike a pose on the roof of the Sloan building.

Reader ROI

- Learn who your future vendors, colleagues and bosses will be
- Find out what they want

PHOTO BY WEBB CHAPPELL



Kurt Leafstrand (left), **Mark Freiheit** (center) and **Ahron Herring** (right) didn't consider how the school would react when they put a student face book online.

MBA Program Director
Margaret Andrews, herself a Sloan alum from the class of '92, says the class of 2001 is "an extremely energetic class. They have a very can-do, very positive attitude. Being so web savvy, they're pushing us to be more

web savvy, and that's a good thing." Al Essa, Sloan's director of information systems, agrees. "Their forward-looking thrust and initiative made us aware that we have to be ahead of them,"

he says. "They're pushing for things to happen so fast, and that pressures us to move fast. The students have very little tolerance for bureaucracy. We see more and more of that pressure every year." To keep up with the students, Essa says that the school's role is to give them guidance, discipline and support. Or, as Morse says, "A rope, resources and a Rolodex."

Even before the students in the class of 2001 set foot on campus, they were using the web to get to know each other. Several entering students launched a club on Yahoo in spring 1999 for new master's candidates. This chat room and discussion board proved to be the ultimate sticky application; at one time it was the largest business school chat club on Yahoo, with 360 people participating. As soon as they hit campus, other students in the class, some of whom had participated in the Yahoo chat club, wanted to set up an online face book and an online

PHOTO ABOVE BY WEBB CHAPPELL; BELOW BY FURNALD/GRAY

Petter J. Karal

Age 27

Hometown Bergen, Norway

Major New product and venture development

Former job Consultant with McKinsey & Co. Imported pens and cassette tapes with a friend when he was an enterprising 11 year old.

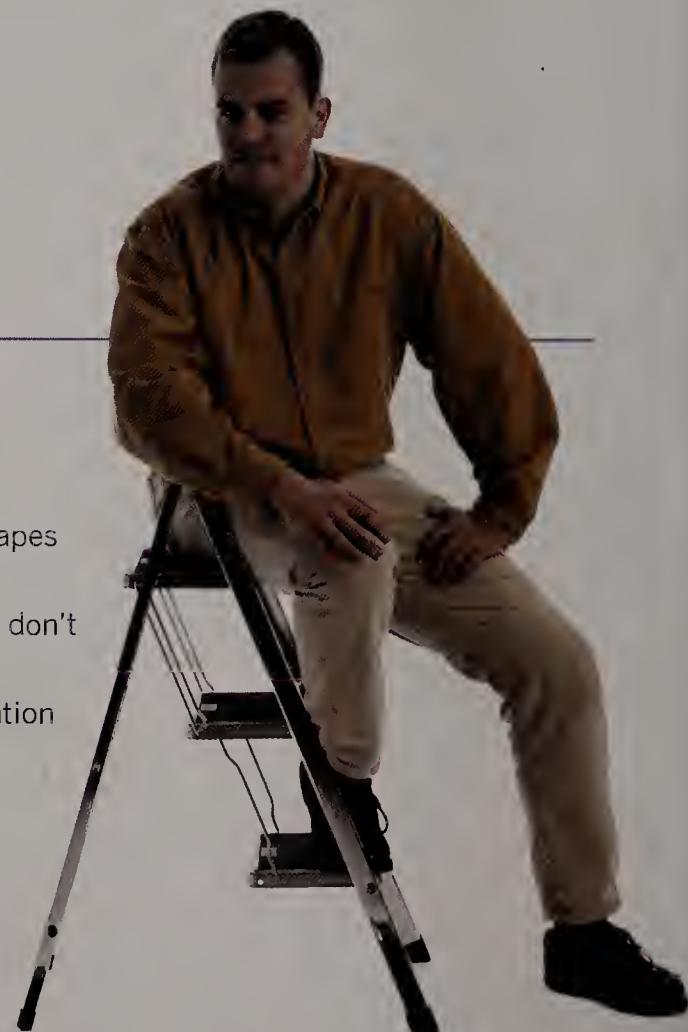
Personal philosophy "I want to take risks, make my mark and make sure I don't step on anyone in the process."

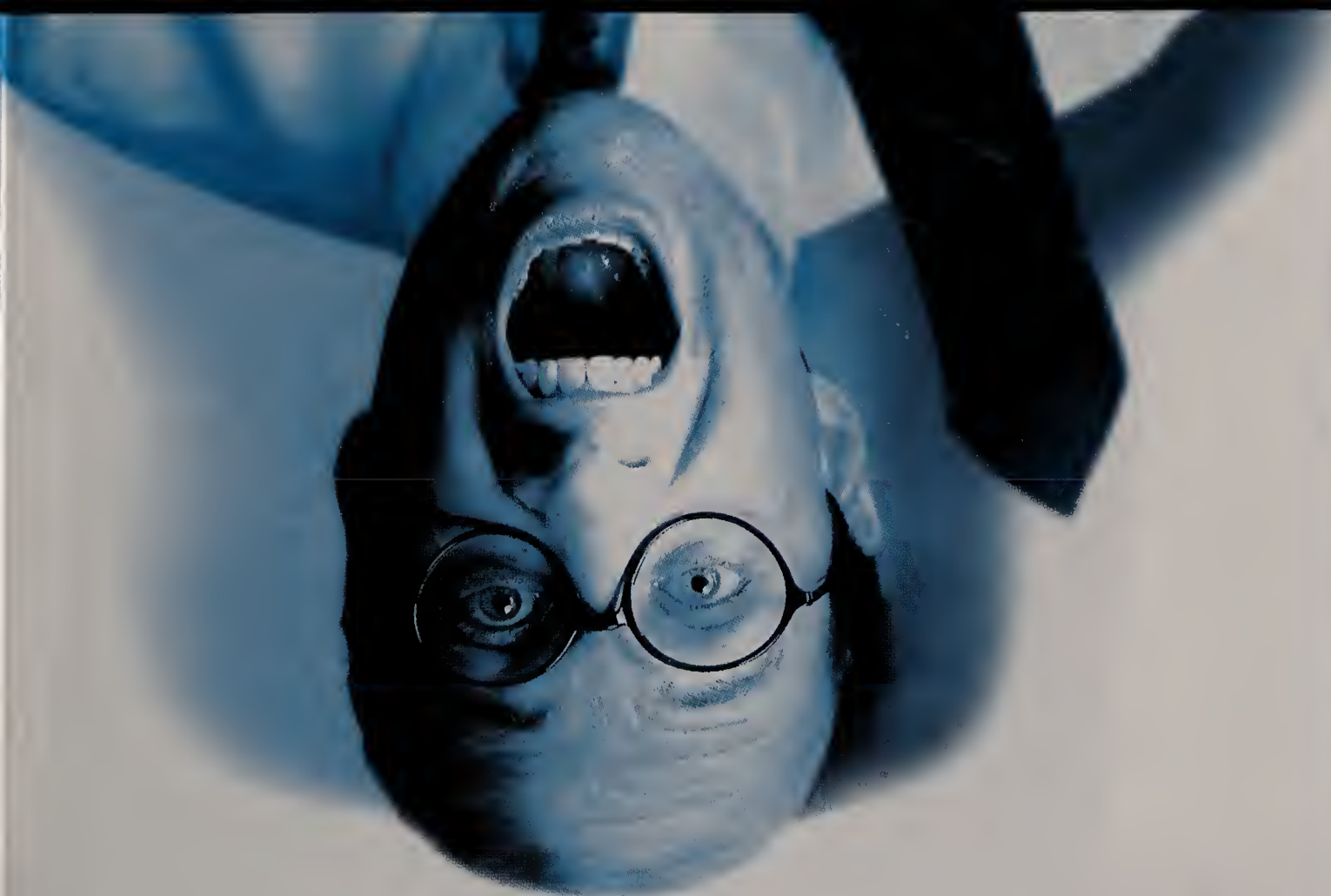
Greatest achievement "At age 17, I was put in charge of organizing graduation celebrations for 11,000 high school students in Norway."

Favorite quote "A plan is nothing. Planning is everything."

Favorite article of clothing "The red-brown shirt I got from my fiancée."

Verbatim "There hasn't been so much change in business since the Industrial Revolution. This means that brainpower is more important than anything. Young people get hired for their brains, not their experience."





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Education

Al Essa (left) and Kenneth Morse joke that the only way to get something done is to let the students do it themselves.

calendar. Though the technology was available, and they knew how to use it, the students ran into snags when dealing with the administration. Even at Sloan, where faculty members view students as the muses of innovation, spitfire change is hard to achieve. And it won't be easy when the students get out into the so-called real world either.

Perhaps that's the biggest lesson they'll learn at one of America's most progressive business schools: Change isn't that easy.

Quick and Dirty

As the class of 2001 filed into a spacious lecture hall in the modern, green glass Tang building (named for Jack C. Tang, class of '49, chairman of Tristate Holdings, a Hong Kong-based apparel manufacturer) during their orientation last August, three students, Ahron Herring, Mark

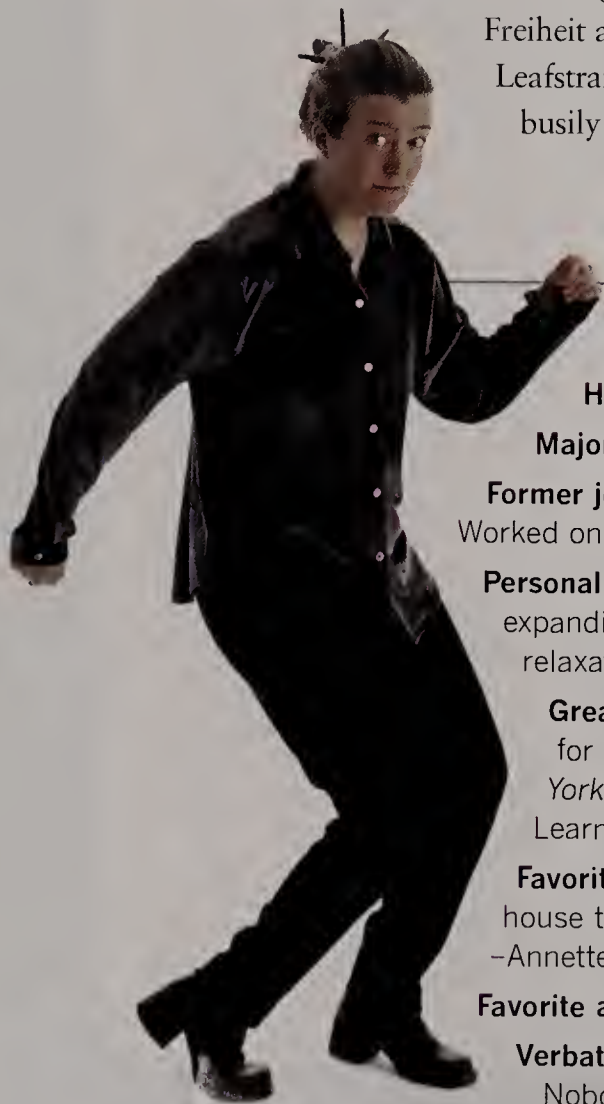
Freiheit and Kurt Leafstrand, were busily creating

an online face book. They thought it would be a good way for the new crop of Sloanies to get to know each other and begin doing

what business students do: network.

Herring wrote down his peers' names as Freiheit, armed with a digital camera, took informal photos of them—some smiling broadly with excitement about the new year, others still groggy from the previous night's debauchery. At the same time, Leafstrand frantically coded an Oracle database application that he adapted from an e-commerce app he had developed for his own software company, Forge Software Corp. (he owns one-third of it), whose product is used for project scheduling in manufacturing. The first semester at Sloan (known as "boot camp" by both students and faculty for its grueling courses in accounting, economics, finance and strategy) hadn't even started, and already these three students were under the gun; they wanted to get the face book online as soon as possible.

And they did. The password-protected face book went live Aug. 24, a week after orientation started. They hosted it on Forge Software's web server. Three days later, they



Liz Rounsavall

Age 29

Hometown Louisville, Ky.

Major Strategic management and consulting

Former job Helped build Simon & Schuster's intranet. Worked on an internet café startup in 1994.

Personal philosophy "Keep learning new things and expanding my scope; balance hard work with serious relaxation."

Greatest achievements "Managing an intranet network for the world's largest book publisher. Finishing a *New York Times Sunday* diagramless crossword puzzle. Learning to drive a stick shift. Learning to water ski."

Favorite quote "I will sell this house today. I will sell this house today. I will sell this house today...."
—Annette Bening in *American Beauty*

Favorite article of clothing "My new black leather boots."

Verbatim "Everyone at Sloan wants to be a leader. Nobody is here because they're an underperformer."

PHOTO ABOVE BY WEBB CHAPPELL; BELOW BY FURNALD/GRAY



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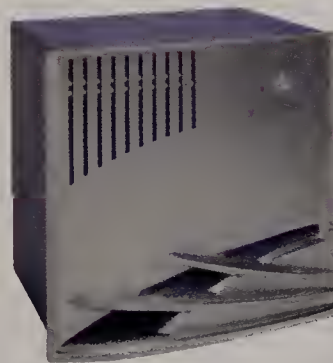
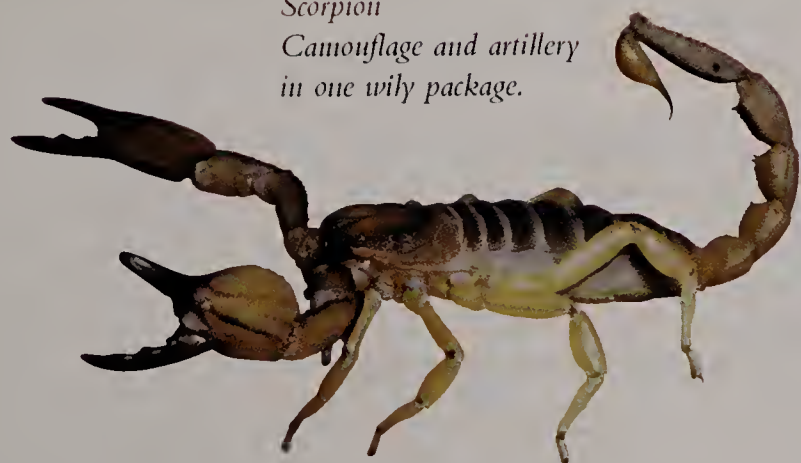
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received an e-mail from Sloan's office of educational services asking them if they had received permission from the students to post this information, who had the right to use it and whether recruiters would be able to see it—questions that in their haste the students hadn't considered. Though they were not told to take down their face book, they were informed that educational services, which was putting together its annual hard copy face book, was planning to post its own version on MIT's website in September. But September wasn't soon enough for Herring, Freiheit and Leafstrand. They knew the students needed it immediately, and that's all they were concerned with when they put it up. Good thing, because the administration's online version never appeared in September. (They had to work out some bugs, they said.) It was scheduled to go live in January. It didn't. And, as of the end of February, it hadn't.

It was then that the enterprising students started to suspect that their quick-and-dirty endeavor wasn't in sync with Sloan's broader and longer-term concerns about its legal responsibility for the content on its website. (Nevertheless, their face book still lives online, somewhere in cyberspace, according to Herring and Leafstrand, who had to neglect the face book once their professors began piling on the work.)

“They know that this is a way station to the **real world**, and they know that they'd better **get real**.”

—Kenneth Morse, director, Sloan's Entrepreneurship Center

The students didn't anticipate having to deal with the 86-year-old institution's policies and procedures. Unless they plan to start their own companies immediately upon receiving their degrees, they'll have to get used to following established ways of approaching projects. For when they reenter the professional world they'll find themselves up against corporate systems, structures, architectures and processes over which they'll have limited control. “They know that this is a way station to the real world, and they know that they'd better get real,” says the tough-talking Morse.

Does this mean that the Sloan class of 2001 will wreak havoc on their companies' IS organizations by developing their own pet projects that don't mesh with the company IT infrastructure? Probably not. They're smart and they're learning that the most successful projects are those that are aligned with long-term goals. Meanwhile, adminis-

trators are finding that the fastest way to finish any IT project is to put it in the capable hands of the class of 2001.

Do IT Yourself

Last May, while every other student at Sloan was cramming for final exams, three ambitious freshmen in the class of 2000 had other things on their mind. Rami Habal (who will be graduating with the class of 2001 because he's pursuing both an MBA from Sloan and a master's in public administration from Harvard), David Lam and Julian Ting were thinking about developing a portal for the entrepreneurial community. E-MIT (*e-mit.mit.edu*), as they named it, would connect the brainpower at MIT with entrepreneurs seeking staff, consulting firms wanting to extend their name to the MIT community and venture capitalists seeking the next billion-dollar business plan. The trio



Smaranda Moisescu

Age 31

Hometown Cluj, Romania

Major Strategic management and consulting

Former job Worked for consulting firm Archimedes Systems in Waltham, Mass.

Personal philosophy “I always try to see the bright side of things and be happy with the choices I make. I want to keep reaching for the impossible.”

Greatest achievement “Balancing a very challenging and successful career with my personal life. [She has two children ages 6 and 9.] Making different aspects of my life complement and support each other.”

Favorite quote “In Romania, we say that each man makes his own luck. I don't believe in winning the lottery. Everything I've done so far was based on hard work and planned thinking.”

Verbatim “I want to return to Romania and help bring the economy out of the dumpster.”

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The E-MIT team (from left): **Julian Ting, Sandeep Swadia, Rami Habal and David Lam.**

organizations that we thought would be interested in it," says Morse.

Then the E-MIT team approached Essa for his IT resources. "I asked them when they wanted it up," recalls Essa. "They said, 'We want it done in a month.' I said, 'A month?' I talked about it with other folks, and they laughed," he says. "The students were determined to build the site, and they would do anything to make it happen. They did all the work and they had a prototype running in two weeks," he adds. Two-and-a-half months later the students had designed, built, funded and launched E-MIT.

"The joke in the administration," says Morse, "is that the only way to do something is to let the students do it themselves." A total of 10 students built the website (there are currently 40 working on it), which as of January 2000 had

put together a 15-minute presentation, which they gave to Professor Morse to get his support and approval.

"I agreed with it on the spot," says Morse. "It was a no-brainer."

But the semester soon ended, and Habal, Lam and Ting left Cambridge for their summer jobs. Habal went to Andersen Consulting Strategic Services to work on a sales strategy project and then joined Cisco Systems in San Jose, Calif., where he worked with the cable broadband group. Lam was also working on broadband projects at Cisco, while Ting served as a product manager for Dell Online in Austin, Texas. The three developed their ideas for E-MIT via e-mail over the summer.

When they returned to campus that fall, they met with Morse, Program Director Andrews, IS Director Essa and Marilyn Cronin from the Career Development Office. Habal, Lam and Ting showed them how registered users would be able to log on and

find a job board where entrepreneurs could post open positions at their startups. Users could join discussion forums and find a calendar of events related to entrepreneurship as well as articles on e-business written by venture capitalists and analysts with PricewaterhouseCoopers and McKinsey & Co.

Habal, Lam and Ting asked the faculty members for help raising money to cover their startup expenses, for things like servers, web tools, IT services and advertising. "We introduced the students to companies and

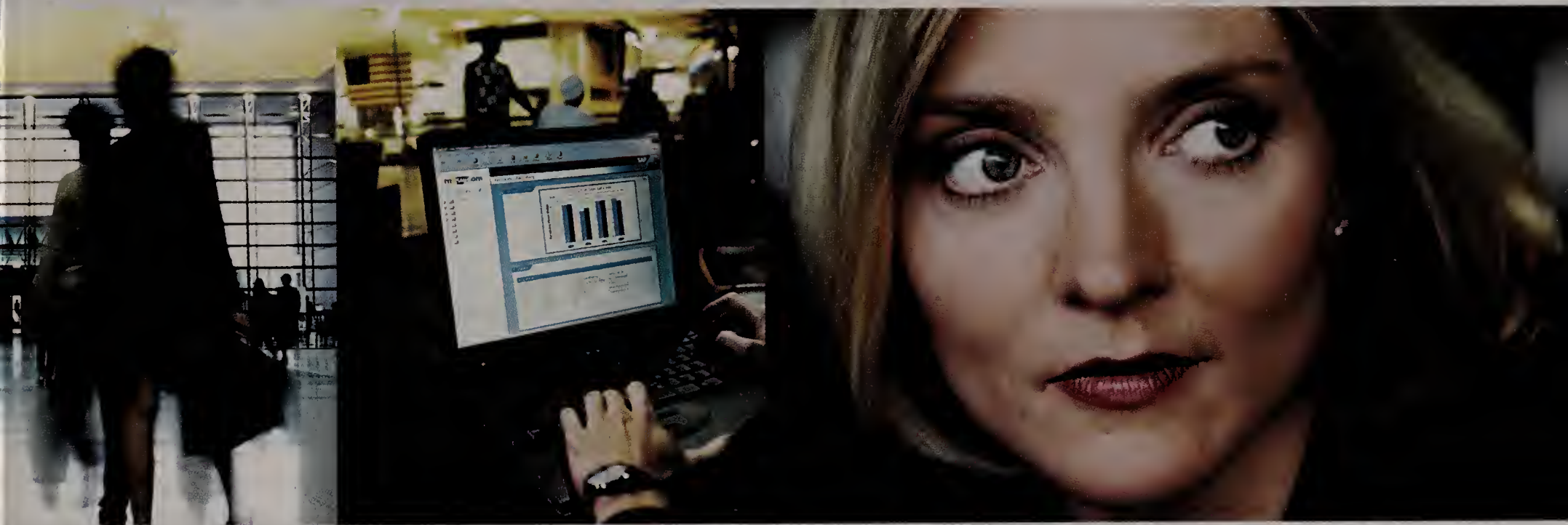
"The students were **determined** to build the site, and they would do **anything** to make it happen. They had a prototype running in **two weeks**."

—Al Essa, director of IS, Sloan School

1,750 registered users, among them CEOs of companies and partners with major consulting firms. (The list is kept confidential.)

Lam, a new products and venture development major, says that although the E-MIT launch process went smoothly, his team spent 50 percent of its time checking in with the administration. "There were an enormous amount of administrative checkpoints that we had to meet along the way. One challenge was continually learning about how things work in a university," he says.

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“What’s important in proposing these projects like E-MIT, is knowing who your **interested parties** are and how you can **bring them together**.”

—Sandeep Swadia

He explains that one of the administration’s main concerns was that E-MIT not be used to make a profit; it would have to remain a nonprofit educational program in keeping with MIT’s nonprofit status.

Sandeep Swadia, another new products and venture development major in the class of 2001, has committed himself to making sure E-MIT lives on when the class of 2000 graduates next month. “E-MIT had so much motivation because there’s so much value. When we talk about it to VCs, their eyes sparkle,” he says. What’s important in proposing these projects, adds Swadia, is knowing who your interested parties are and

how you can bring them together.

And that’s another thing the class of 2001 really knows how to do. Lam says that students like Swadia (who also helped launch the popular Yahoo club) are best suited to find solutions to one of E-MIT’s biggest challenges—building a community for its users. Lam explains that E-MIT is a way for them to take what they learned from the Yahoo site and channel it toward a more public effort, while helping them build skills that employers value highly. “Being a leader in our group, you see all the technical challenges related to building a website and running a web business,” says Lam. For

instance, he and his teammates are constantly thinking about the reliability of the site: It has to be up 24/7 and users have to be able to log in easily. Scalability is another issue. Within just six weeks of the Dec. 4, 1999, launch, E-MIT had nearly 1,800 users, and Lam anticipates strong growth.

As long as these student-run initiatives serve a multitude of interests, including those of the faculty and the business community, these plans will roll smoothly. But what happens when they don’t?

Steering the Queen Mary

Another project that the class of 2000 initiated that 2001 saw come to fruition is an online calendar listing all the events taking place on the Sloan campus. “It’s been talked around school a lot, a year before I got here,” says Andrews, who became program director in August 1999. “When I came on, there was much more talk about the calendar. The students were saying, ‘We need this. It would help us manage our lives better.’ We said, ‘Yeah, you’re right.’” She adds that

Sandeep Swadia

Age 30

Hometown Bombay, India

Major New products and venture development

Former job Led the internet division of System Resources Corp. (SRC) in Burlington, Mass. Most recently worked for Boston-based Computer Sciences Corp.

Personal philosophy “To align myself with principles such as integrity, trustworthiness, sharing and fairness. These deeper values are always more lasting than quick charisma.”

Greatest achievement “Professionally, I am proud to have risen in SRC from a summer intern to a program manager. In the musical arena, I have been fortunate to perform at Radio City Music Hall and Madison Square Garden. [Swadia plays percussion.] As a community servant, I found gratification from working with second-generation Indian youths to preserve and promote South Asian culture. Personally, I feel thankful every day that I had the courage to move to the U.S. from India.”

Favorite quote “Skate where the puck is going to be, not where the puck is.” —Wayne Gretzky

Verbatim “I don’t want to be the next Amazon.com. I have nothing against Amazon, but I don’t know where they’re creating value. My personal problem [with that] is that you start a company and are thinking about an exit strategy. If I have to start something, it had better be long term. It’s like falling in love.”

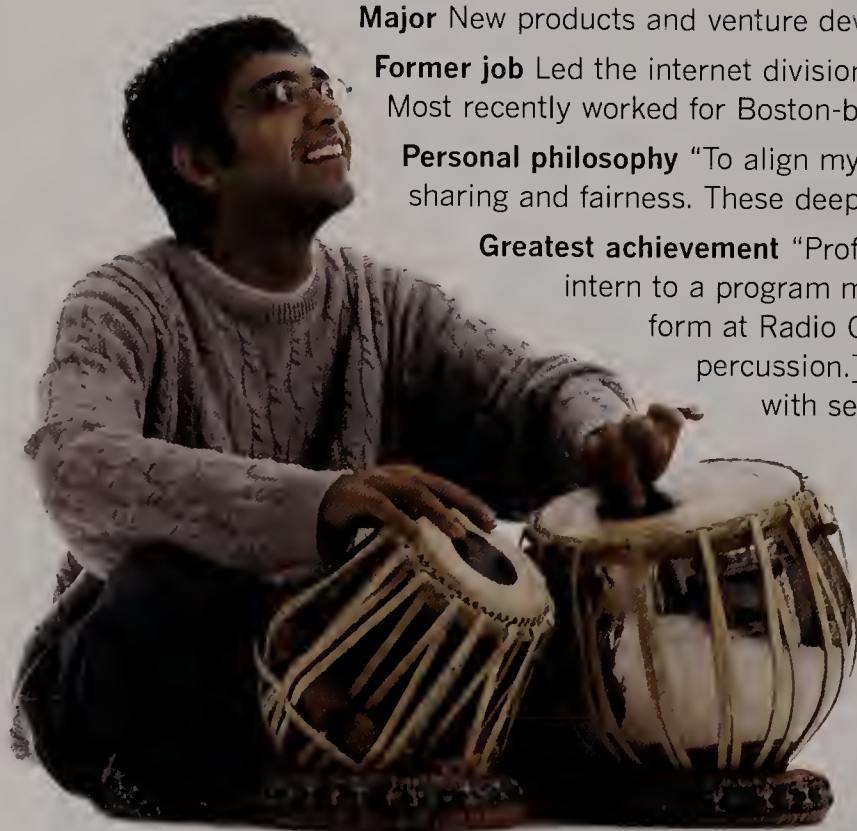
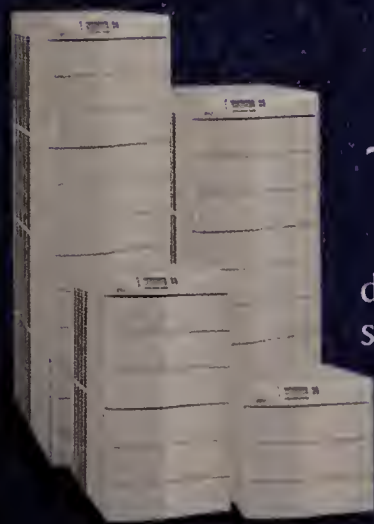


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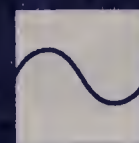
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after a year of talk it was only in January 2000 that students and administrators finally drew up a proposal for it. (The calendar went live the following February.)

Granted, the implementation took a quick four weeks, so why did it take a year to draw up a proposal?

"If the calendar was a stand-alone project," says Essa, "it would be a no-brainer. We could have had it up in a few days. But with IT, things have to be integrated. If it's going to be institutional, it needs to sync to other databases on the network." Essa explains that students tend to focus their efforts on getting a project up and running while overlooking both the impact on the school and how they're going to sustain it. "People think technology is the solution, and they underestimate the process," he says.

Liz Rounsavall, a 29-year-old strategic management and consulting major from Louisville, Ky., who sees firsthand working on the student government how difficult it can be to coordinate efforts between students and the administration, offers her perspective.

"Anytime you try to change a big institution, it's like trying to steer the Queen Mary. In the end, the administration is a political body. They'll be here in two years and we won't. As long as it looks good for

pany's computing architecture and the impact it has on the total cost of ownership.

But what's different in the case of Sloan is that many of today's students will be tomorrow's CEOs and CFOs. The students in the

The **administration** has to keep an eye on **standards** to make sure they are **integrated** with the **long-term infrastructure**.

prospective students, they'll be supportive," she says.

Like the face book, the calendar project highlights the inevitably diverging agendas of students and administrators. Students come to Sloan for two years, demanding certain applications without being overly concerned with IT standards and policy issues. The administration, by contrast, has to keep an eye on standards to make sure they are integrated with the long-term infrastructure. This sort of dynamic is reflected in the real world, where end users want their company desktop PCs to have the same applications and features as their home computers, without realizing what that means for the com-

class of 2001 will no doubt have a less general and more value-based understanding of technology and its business applications than the current breed of AARP-card-waving CEOs. Because of their constructive attitude toward information technology, this generation of technology-friendly MBAs finally has the proper skills and education to resolve the business and IT alignment conundrum that has puzzled executives for far too long. Under their purview, business and IT will be inherently aligned.

In web-enabling student life, the class of 2001 is learning the importance of understanding the environment in which they are working to effect change. Herring summarizes what he learned from working with the Sloan administration on the face book: "The school is an ongoing process. When you innovate, it has to be in the context of the ongoing evolution of the school. MIT does a reasonably good job of balancing policy concerns with the need to innovate. It can be really dynamic, yet it's not a four-person startup that can sit down over coffee and switch markets. The school needs to ask where it really wants to go as an institution over the long term."

Then, Sloan has to find the students, like those in the class of 2001, who can take it there. **CIO**

Staff Writer Meridith Levinson was impressed by the Sloan students she met. Were you? E-mail her at mlevinson@cio.com.

Ahron Herring

Age 25

Hometown Hollywood, Fla.

Major New products and venture development

Former job A bond market salesman with Merrill Lynch

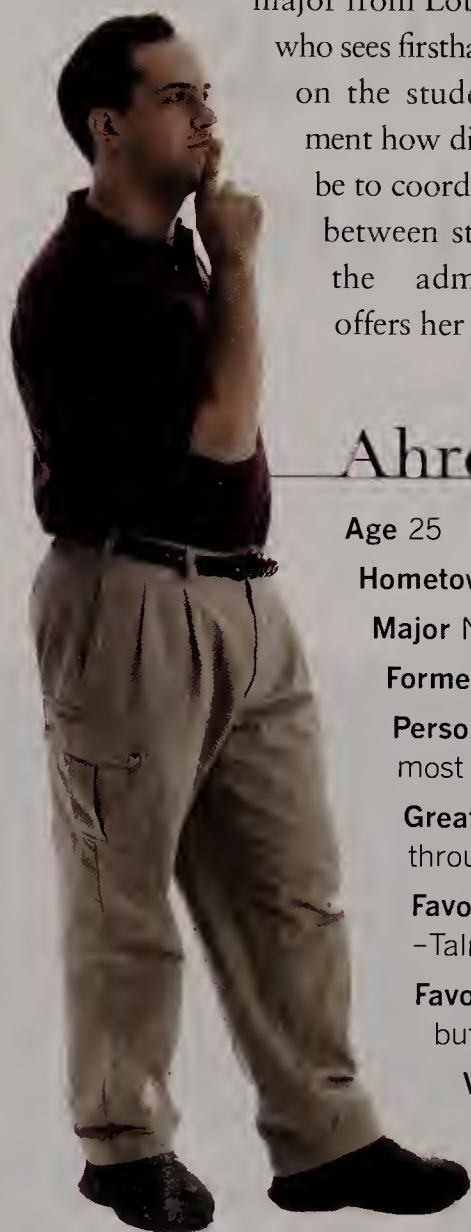
Personal philosophy "Appreciate what I have, aspire to the most I might achieve and share in success with society."

Greatest achievement "Being a steadfast friend to my brothers through thick and thin."

Favorite quote "A good name is better than the finest oil."
—Talmud, Ethics of the Fathers

Favorite article of clothing "A tuxedo because you can't help but look good when you're all purty'd up."

Verbatim "Innovation doesn't happen every six months. It happens every two months, if not more often. Organizations need to ask themselves, How open are you to constant innovation?"



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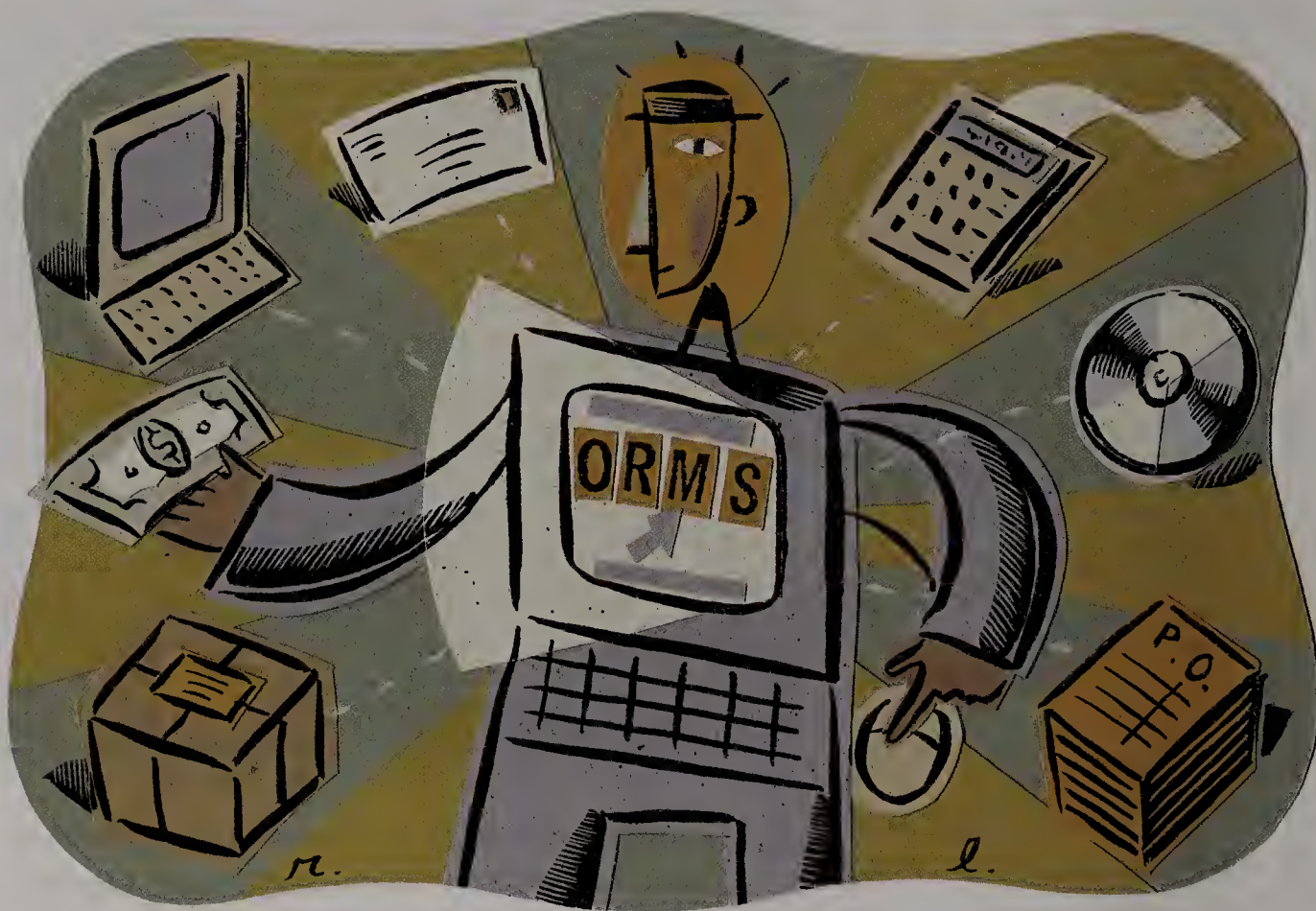
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Better Buying Online

Procurement software can streamline ordering and help you find bargains—but it's still in its infancy BY HEATHER HARRELD

Edited by Sari Kalin and Chris Lindquist. Send your thoughts and ideas for future columns to et@cio.com.

WHEN YOU SPEND \$10 billion annually on materials and services, anything that gets you better prices or makes for a more efficient buying process looks appealing. For San Francisco-based Chevron Corp., internet procurement

offered both lures—letting the company simplify its ordering structure while simultaneously helping winnow its list of 28,000 suppliers down to those offering the deepest volume discounts.

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"The overall goal is to direct the spending and eliminate maverick or rogue buying," says Chevron CIO Dave Clementz. "Channeling these expenditures is going to get the savings. We've seen discounts of anywhere from 10 percent to 30 percent from suppliers."

To find those savings Chevron chose a solution from Ariba, called the Operating Resource Management System (ORMS), which provides a front-end to support online transactions and link purchasing data to ERP and legacy systems. The software lets buyers place orders via a desktop web browser while streamlining other business processes, including requisitions, purchase orders, expense requests and ser-

vice orders. ORMS even provides analysis and reporting tools that let users evaluate purchasing data, a feature that Clementz says is key to negotiating discounts.

some businesses are turning to procurement software solutions for buying commodities such as office supplies. On the sell-side of the market, companies are exploiting web-based commerce software to extend ERP and other systems to their customers. Then there's the dark horse—e-marketplaces—that hope to attract both buyers and sellers to their web-based business-to-business sites.

Buy-Side Specialists

Buy-side software puts the purchasers in control, letting them create a single web-based interface to their suppliers. The benefits of such a system can extend beyond simply finding the best price quickly. A

A recent Concours Group survey of buy-side users found that many CIOs did not factor in the hefty integration costs often associated with launching internet procurement initiatives.

properly implemented system can also reduce operational overhead.

That's what Alan Daniel, procurement tools manager at Dallas-based Texas Instruments, was looking for when he evaluated procurement software for his company. "Most of the cost of processing the transactions is tied up in the people who are doing it," Daniel says. "Wherever I can redeploy the operational resources to supplier management, that's the thing that allows me to get material cost savings."

Extra efficiency and discounts definitely attract attention. Fueled by widely publicized growth opportunities—Forrester Research predicts that U.S. internet business-to-business sales will grow from \$406 billion this year to \$2.7 trillion in 2004—the internet commerce software market is becoming crowded with products. But according to Forrester, the most obvious potential providers—ERP vendors—have been late to market with web-enabled versions, and many businesses report that the existing solutions do not offer the flexibility needed for e-commerce. In the meantime,

Daniel says his company would have had to hire 20 additional people to process the orders that the company's new Intelisys Electronic Commerce (IEC) enterprise system handles. The IEC system, which replaced a homegrown legacy catalog procurement system, connects buyers to suppliers through the purchaser's browser

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and includes built-in controls to ensure that only authorized buyers make purchases and that those purchases fall within preset spending limits. The company, which spends approximately \$5 billion on goods and services each year, intends to use the system to take care of 30 percent of its procurement transactions.

Not Necessarily Easy

It all sounds good, but early adopters have encountered pitfalls with buy-side technology, says Edward Roche, vice president and research director of The Concours Group, a Kingwood, Texas-based

ERP system you need to attach. Connecting legacy systems will require custom programming. And these interfaces may need further revision as new versions of the procurement software or the ERP system roll out.

In addition, Roche says vendors in the emerging buy-side market have yet to settle on firm pricing structures for their solutions, leaving ample room for savvy CIOs to negotiate attractive price tags for procurement software.

"They sort of price it based on how much you can pay and what it's worth to you," Roche says. "The best advice is to

"Some of the biggest issues that we have to deal with are the cultural issues involving the romantic attachment to the old-style system."

—John Ramacciotti, vice president of procurement, Cypress Semiconductor

research and consulting firm. He says a recent survey of buy-side users found that many CIOs did not factor in the hefty integration costs often associated with launching internet procurement initiatives. He adds that while the basic software for digital purchasing systems is reasonably priced, his research indicates that the costs to integrate those with ERP systems or legacy ordering systems can be two to five times more than the cost to install an isolated system.

"The CIO needs to consider how the system fits into the entire purchasing cycle, not just the price comparison and the purchasing order itself," he says. "It is the interface between the digital purchasing system and your preexisting enterprise process that is a serious risk in adopting this technology. It's being done, but basically it's an integration issue that you've got to build into your cost estimate."

The interface also depends on what

get a really tough negotiator in there to cut the deal."

Technical implementation and price may not be the only hurdles, though. Before launching its new Ariba ORMS procurement system last September, San Jose, Calif.-based Cypress Semiconductor still relied on a paper-based requisition process. When fully implemented during the fourth quarter of this year, the software will help the company purchase between \$90 million and \$100 million worth of supplies annually, says John Ramacciotti, Cypress's vice president of procurement. Despite the seemingly mammoth technology leap from the old system to an online system, however, Ramacciotti says the toughest challenges he faced revolved around people, not technology.

"Some of the biggest issues that we have to deal with are the cultural issues involving the romantic attachment to the

new products

can access product development information via a web browser, helping to speed product development. Among its features, the suite offers project planning, project management, resource allocation and portfolio management capabilities; it can interface with Microsoft Project and other such tools. The system costs \$170,000 per application server and \$2,000 per user; a typical deployment at a company with 75 users costs \$387,000. For more information, visit www.ide.com or call 978 318-9380.

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old-style system," he says. "The first and probably most important issue that you've got to address is the cultural change. There's a lot of preselling and groundwork preparation that needs to be done."

Sell, Sell, Sell

On the sell side, commerce software extends a supplier's internal business data, often contained in ERP systems, to customers via a web browser. Ideally, the technology provides customers a self-service solution for work that they often would have performed over the phone, such as placing orders and tracking shipments. Many vendors in this arena have grown up focusing on specific vertical markets, such as health care or manufacturing and distribution, with current sell-side market leaders including Ironside Technologies, Open Market and Art Technology Group.

School Specialty, a school supply company based in Appleton, Wis., is using Ironside's Ironworks software to allow school districts nationwide to place electronic orders for desks, chairs, laboratory equipment and other supplies. Douglas Lape, School Specialty's vice president for internet development, says the Ironworks thin-client solution allows customers to access product descriptions, photographs and other information in less than 1.5 seconds.

In addition, he says, the system lets the company's 270-member sales force abandon order-taking duty and spend more time helping customers. The product has also slashed order-processing times from three weeks to three minutes.

"The competition...is not the brick-and-mortar company that sells the same school supplies," Lape says. "It is the dot-com company. The fact that you fill the order does not give you a leg up if you're not providing the internet services."

Laurie Orlov, research director for eBusiness applications at Forrester Research, says potential sell-side users should look for vendors that have a strong track record developing solutions for customers in their specific industry. In addition, solutions should integrate order taking with customer profile information so that customers can move seamlessly from dealing with suppliers over the phone to accessing applications.

Marketplace Madness

Then there are the marketplaces. These newest players in the e-commerce market—including companies like Tradex Technologies (recently acquired by Ariba), Virtual Source and ConnectInc.com (now

part of Calico Commerce)—offer application platforms or subscription services to websites that link buyers and sellers from within vertical markets. More than simply procurement tools, these sites often have features such as auctions and chat rooms. Even buyers are getting into the game—Chevron, for example, is extending its solution to allow other energy companies to purchase goods and services from common suppliers. And Forrester predicts that 53 per-

cent of business-to-business purchasing will be through marketplaces by 2004. But, Orlov warns, this evolving market has yet to crystallize, and CIOs should not yet view these offerings as long-term solutions.

"Anybody who buys now should understand they may have to throw it away," she says. **CIO**

Are you exploring the buy side or the sell side of procurement software in your organization? Technology Editor Chris Lindquist would like to know (et@cio.com). Heather Harreld, a Raleigh, N.C.-based freelance writer, can be reached at harreld@aol.com.

BUZZ WORDS

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REVISIT
EDI

Slow Train Coming

Costly and complex, EDI has hardly been on the fast track for growth, but the internet and XML promise to broaden its reach

BY FRED HAPGOOD

DURING THE Berlin Airlift in 1948 and 1949, the U.S. Air Force was faced with the need to unload and turn aircraft around on the ground at unprecedented rates. They solved this problem partly with the help of a new system, invented on the spot, for using Morse code to radio the freight manifest of each flight to the ground teams responsible for unloading that plane in advance of the actual landing. Legend has it that when the personnel behind this effort returned to civilian life, they realized that their codes could be used in another application: teaching computers to understand business.

The idea was to assign standard names to classes of business data, specify standard relations among those classes and design standard representations for those data and relations. Once these standards were coded into programs and distributed, machines would know which data served inventory and which served personnel. Automation would be simpler to design, business interactions would turn over more quickly, paper handling costs would be reduced, and data entry errors could be minimized. Companies were formed and by the late '60s and early '70s articles began to appear about the concept we now know as EDI, for electronic data interchange. The first applications were in transportation.

In the '70s EDI was developed almost entirely inside large companies as a way of making the data and operations maintained on a company's mainframe mutually comprehensible to all departments. Many companies developed their own EDI language, but during the '80s com-

mon standards were hammered out in several industries. EDI users were soon eager to start using these industrywide standards to support buyer-seller transactions: purchase orders, inventory, invoices, remittances and the like.

Unfortunately most of these value chains had a mix of company sizes, and the smaller companies, companies without mainframes, were nowhere near as ready. Even in the '80s most businesses used computers only for payroll. From their point of view EDI came with serious extra costs, including hardware, software and software management, access to a value-added network (VAN) and data entry costs. "This is the first application (since the telephone) where you are trying to put

technology in somewhere other than your own branch offices," CIO said, quoting an EDI marketing director in an article published in October 1990. "It takes patience, dollars and time."

Ten years later, according to Ken Vollmer, a senior industry analyst at Giga Information Group in Cambridge, Mass., only 300,000 American businesses use EDI. However, Vollmer expects this enrollment rate to more than double over the next five years. He argues that the environment has become more favorable to small businesses. Computers are cheaper, software is easier to manage and the internet offers much lower connectivity costs compared with VANs. While almost all EDI data was carried over VANs in 1997, the analyst expects as much as 50 percent of it to be carried by the internet over the next few years.

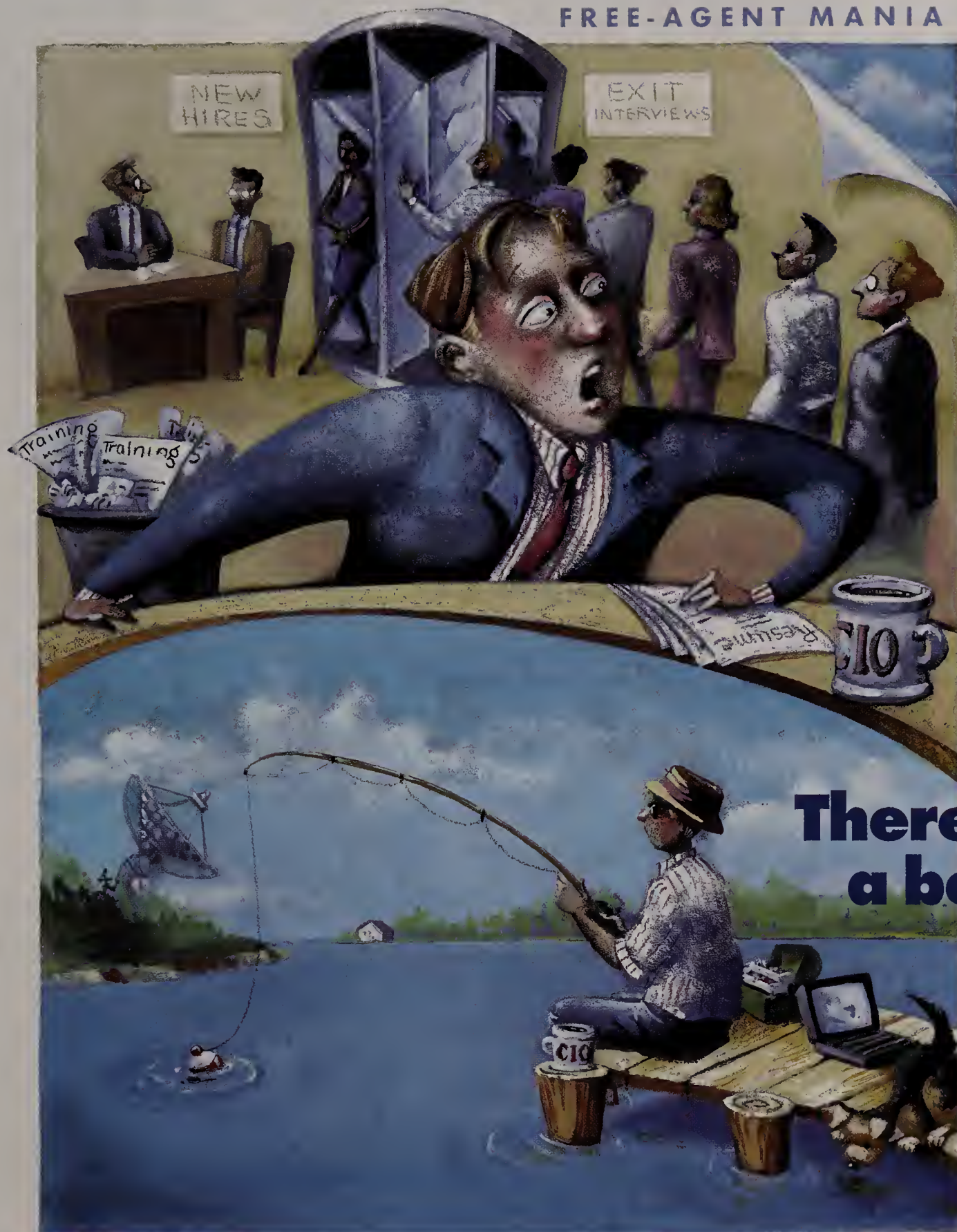
One change looming over the EDI universe is the imminent adoption of XML as a standard way of coding EDI standards. XML is an object representation language that is designed to include a flexible and dynamic range of information about the objects it represents. This makes it ideal as an EDI template. Kendra Mar-



ILLUSTRATION BY BRIAN RASZKA

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tin, who is on the board of directors of the Data Interchange Standards Association, the national EDI/EC standards group based in Alexandria, Va., believes that XML will allow standards bodies to concentrate on business models without worrying about technical or syntactical details, which she thinks will make it easier to move EDI into new sectors and extend its range in old ones.

Martin believes that in the near future EDI will be used to generate online Java objects, such as catalogs or regulatory information. She also sees the technology shifting from supporting primarily point-to-point, two-party transactions, to complex, many-to-many collaborative interactions. In those types of interactions, data would flow from one distribution topology to another as needed, and virtual organizations would form and disband as needed—the Just-In-Time corporation. Finally, she expects EDI to help catalyze

the organization of a truly global marketplace, since, properly extended, it would form the basis for a universal language for commercial interactions worldwide.

But it might not work out that way. As Tim Cronin, director of business-to-business integration for the e-commerce consulting company Avicon.com in Natick, Mass., points out, EDI has always worked best among partners that need to exchange stable and well-defined data sets. “Where you have innovation, competition, rapidly changing business models, EDI is a drag,” he says, citing electronics, where EDI penetration is very shallow, as an example. At present, global business seems to be moving toward the end of the spectrum that makes EDI less useful rather than more. The technology might still fulfill the dreams of its enthusiasts, but the conclusion of our piece 10 years ago still looks sensible: This is going to take patience, dollars and time. ■

PREDICTIONS

information appliances

Internet Everywhere

MOVE OVER PCs. By 2002, Framingham, Mass.-based IDC (a CIO sister company) expects total shipments of information appliances to exceed consumer sales of personal computers in the United States. While consumers are expected to buy 23.9 million PCs that year, sales of information appliances—digital consumer electronic devices that offer cheap and easy internet access—will rise to 27.3 million. By 2004, more than 89 million of these appliances will be sold worldwide, accounting for more than \$17.8 billion in sales, a dramatic increase from the 11 million appliances and \$2.4 billion in worldwide sales achieved in 1999.

What exactly is an information appliance? IDC includes gizmos such as NetTV devices (web-enabled set-top boxes, along with products such as WebTV), web and e-mail terminals, smart handheld devices and screen phones. NetTV devices, gaming consoles and smart handheld devices will make up the bulk of the market, says Bryan Ma, an analyst in IDC's consumer research program. But Ma notes that these estimates do not mean the PC is dying. “We do see growth in the area [of PC sales],” Ma says. “But the PC is not going to be the only way to go to the web anymore.” And in many instances, consumers won't even realize that they are accessing the internet when they use these information appliances to shop, play games or check stock quotes and movie listings.

—Sari Kalin

new products

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For publishers who don't just want to give their copyrighted content away, **DigitalOwl.com** can help collect what's due to them. The company's electronic content distribution system, called **KineticEdge**, lets newspaper, magazine, journal, book and other publishers package, distribute and sell digital content online—and do so securely.

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Ted Graham,
Hill & Knowlton's Knowledge Manager



UNDER DEVELOPMENT

aviation

Flying the Safer Skies

A PAIR OF NEW aviation technologies won't guarantee you extra legroom or friendlier service on your next flight, but they may some day help ensure that you arrive in one piece.

At Texas A&M University, researchers are testing a cockpit computer that uses humanlike "fuzzy logic" to determine what a plane and its pilot are doing and how well they're doing it. John Painter, a semiretired A&M professor of electrical engineering, aerospace engineering and computer science, and one of the system's developers, says the General Aviation Pilot Advisor and Training System (Gapats) is designed to alert pilots to potentially dangerous situations. For example, the system flashes a warning message if the pilot tries to land without first lowering the plane's landing gear. Gapats has undergone flight simulator tests as well as trials on a university plane. The researchers are now seeking funding that will enable them to develop a commercial version. "The idea is to give pilots advice and information without increasing their overall workload," says Painter.

Meanwhile, a new Synthetic Vision technology aims to help pilots navigate planes safely through zero-visibility skies. Under a NASA contract awarded last year, Lincoln, Mass.-based Avidyne Corp. and Portland, Ore.-based AvroTec are developing a cockpit computer system that will give pilots a detailed and steady flow of external visual information, regardless of the time of day or prevailing weather conditions. The Synthetic Vision system will use weather radar, GPS technology, wireless data links and an LCD screen to supply pilots with a Microsoft Flight Simulator-like view of

the outside world, complete with 3-D renderings of terrain, nearby aircraft traffic and runways.

The arrival of faster computers and increasingly sophisticated 3-D graphics technology are combining to make Synthetic Vision a potentially practical and affordable technology. Dan Schwinn, Avidyne's president and CEO, hopes the system will be adopted by the aviation industry within the next three years. Schwinn adds that the ultimate goal is to make Synthetic Vision a primary reference tool, which would allow pilots to fly a plane from takeoff to landing without ever looking outside at the real world. "That's the holy grail, to create a 3-D image that would actually be projected onto the window. It's a long-term objective, but something that we're definitely moving toward." —John Edwards

The arrivals of faster computers and increasingly sophisticated 3-D graphics technology are combining to make Synthetic Vision a potentially practical and affordable technology.

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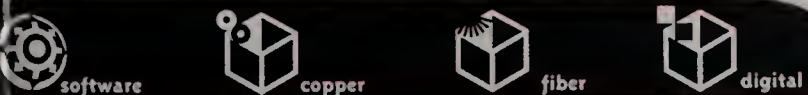
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Opinion

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CIO Confidential

Only the Names Have Been Changed

Mission Impossible

BY ANONYMOUS

I'M STANDING 20 feet above the ground on a 1-foot-by-1-foot piece of plywood attached to the top of a telephone pole planted in a south Georgia pine forest. It's August, and I'm sweating like Bill Gates at a Janet Reno testimonial dinner under this silly helmet (like wearing it will do me any good) while a horsefly the size of a dog practices touch-and-gos on the back of my neck. Peering down while my fellow executives on the blessed ground yell encouragement, I'm expected to leap off this little platform and catch a trapezelike bar suspended a few feet in front of me. If I miss, my "teammates" hanging on to the tether rope will stop my fall and lower me slowly and gently to the ground. This metaphor for the workplace would be accurate

only if the rope were around my neck.

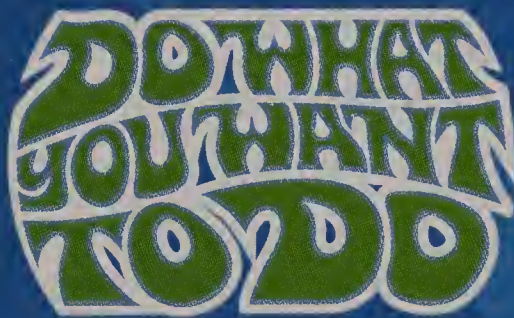
Trying not to look aggravated with a huge vein popping out of my forehead is tough. I think the involuntary whimpering might also be a giveaway. I wouldn't have agreed to climb up here except that my utterly tiresome male ego took over in the presence of the female executives. (Hey, I'm not proud of it!) If I weren't hooked to this rope, I'd jump off this platform and let the HR genius who thought up this nonsense break my fall.



ILLUSTRATION BY DAN VASCONCELLOS

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Welcome to the world of artificial team building by crisis fabrication. (Like we don't have enough real crises to go around.) This fun-packed weekend is billed by the perky coordinators in khaki shorts as, among other things, an opportunity for us executives to "win together" in an informal, noncompetitive environment. Further, it's supposed to help us break through the facades and "get to know the people behind the titles." How's that for an intellectual air ball? Fourteen type As, who by hook or by crook have made their way to senior management of a Fortune 500 company, will suddenly stop being competitive and behave like normal people. If companies were serious about having their executives drop their pre-

As often as not, those exhibiting the most astonishing levels of incompetence are handsomely rewarded while the intellectual assets of the company are being pushed out the door.

tensions and start playing nice, they'd have them bring their mothers to work, because most of them wouldn't dare behave the way they do at work in front of their moms.

If your company is like mine, it spends a fortune every year on this kind of nonsense. It's part of an attempt to repair all the damage we did to the cultural fabric of our companies during the last 10 or 15 years of reengineering/downsizing (one of the silliest, most pointless management fads since the directive to issue helmets to kamikazes). Before academics and consultants sprayed perfume on it and declared it reengineering, there were already thousands—perhaps hundreds of thousands—of targeted, internally driven, cross-functional process improvement projects going on in companies all over the world, successfully reducing costs and improving quality and customer service. Sure, they didn't have complicated "change models," legions of \$400-per-hour experts to explain the change models or downsizing hit men cruising the hallways, but they did get results, and they managed to do it without destroying any lives or the soul of the company.

In an era when corporations are unashamed and often hailed by Wall Street for laying off thousands of employees, the euphemism "team member" can fall pretty flat, even with the people left standing. Most cases of massive layoffs are a mystery to me in that, as often as not, those exhibiting the most astonishing levels of incompetence are handsomely rewarded while the intellectual assets of the company are being pushed out the door. Instead of applauding senior management's decisive cost-cutting action, why aren't they the first to be fired?

An organization's need for such layoffs should raise a red flag the size of my great uncle's boxer shorts that top management is either incompetent for hiring more people than the company needed or insane for letting productive, valuable workers go for some short-term improvement on the expense line. Couldn't better forecasting of business trends or normal employee turnover and retirements get them where they wanted to go?

And if all these layoffs weren't penance enough, here I am standing on the top of this pole.

Tomorrow's indoor activities include four hours set aside to write a new mission statement for the company. Most of the

mission statements I've read, those odes to corporate joy, aren't worth the frame they are mounted in. What makes them so bad is their inability to state the company's reason for being and clarify for their employees what management believes is *really* important. I sent a note to our meeting coordinator suggesting an easier (cheaper) way to do this. The internet now has

websites featuring mission statement generators complete with a standard offering of insufferably trite phrases and seamlessly interchangeable verbs and adverbs to produce truly motivational gems without the bother of lengthy retreats or expensive consultants. My favorite generator can be found at www.dilbertzone.com. Here's a statement I produced last night:

It is our mission to assertively supply unique solutions while continuing to enthusiastically administrate world-class materials and quickly leverage others' value-added benefits so that we may endeavor to competently integrate scalable paradigms for 100 percent customer satisfaction.

Sadly, this is far better than our current mission statement.

Now, I wouldn't want to leave anyone with the impression that I think mission statements, especially for IT departments, are a bad idea. In fact, a statement that is written in English without the new-age gobbledygook, that is brutally accurate and short enough for everyone to memorize, can actually be pretty motivational or, at the very least, win you some points with your folks for honesty. For instance, how about this for an IT department:

Our mission is to be left alone to create and run systems that our company can use to beat the competition bloody.

Terrific, isn't it? Simple, upbeat, true, with the company's best interests at heart, and there isn't a chance in hell I'll be able to make it fly in tomorrow's session.

I think it's time we held a nationwide search for the best IT department mission statement—a statement that features all

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of the aforementioned virtues and can be used by any IT department in any industry. Those wishing to participate should send their entries to the e-mail address or website at the end of this column in, say, the next 30 days.

It's a strange team-building exercise that has me up on the pole alone and everybody else on the ground. Nobody's going to climb up here and give me a push or a hand down. As always, I leap on my own.

The rules, like the statement itself, will be simple. Selection of the best entry will be by a panel of judges consisting of me, my therapist and the next person to walk through my door to ask for a favor. All decisions are final and potentially in error. Mission statements containing *world class*, *value added* or *paradigm* will be immediately disqualified without consideration.

The people who submit the best entries will get the satisfaction of having their mission statements (and bylines) printed in a future issue of *CIO*. If for some reason you wish to remain anonymous, I will completely understand.

A moist, hot wind moves through the trees in front of me, and the pole begins to sway. As much as I hate to admit it, this exercise may turn out to be more instructive than I gave it credit for. It's a strange team-building exercise that has me up on the pole alone and everybody else on the ground. Nobody's going to climb up here and give me a push or

a hand down. As always, I leap on my own.

IT has always been about just that very thing. **CIO**

Got a great mission statement for IT? Share it with other readers at comment.cio.com, or send it to Anonymous, who welcomes mail from corporate survivalists at confidential@cio.com. Let us know if we may publish it, along with your name, title and company.

Coming in CIO

Look for These Articles in Future Issues

Global Architecture

We will look at the clash of styles for developing IT architecture traditionally (emphasizing risk management, stability and careful planning) versus the need for speed and flexibility required by web commerce initiatives. How are these two opposites being reconciled? Can they coexist in a company?

Planning for the Worst

What's the best way to anticipate weak points in your company? Try destroying it yourself. That's the basic idea behind General Electric's "Destroy Your Business" approach to strategic planning and dealing with the threats to its business posed by the internet. See what GE learned from this experiment and if it could work for you.

Hack Attack

If you can't beat 'em, hire 'em! This story will explore organizations that hire hackers to teach classes to IT staffers to help them safeguard the corporate jewels. Thirty percent of the attendees at the CIO Enterprise Value Retreat said they would hire ex-con Kevin Mitnick. Why?

After the IPO

We've all heard how grueling startup life can be, but the stories of instant wealth once the company goes public are often enough to entice even the reasonably sane. However, CIOs need to keep a few things in mind. Here's the story of what life is like post-IPO at three companies: VerticalNet, Outpost.com and Audio-Highway.com.

Public-Sector Staffing

Having trouble attracting good IT staff to your company? So are federal and state agencies. Learn ways they are trying to attract IT professionals to government service, and whether it's working. We'll talk to consultants who have worked with federal and state CIOs to develop IT staffing strategies and placement firms that know what attracts IT professionals to a particular job, public or corporate.

Financial Industry Profile

Whether the market is up or down, everyone, it seems, is talking about the financial services industry. Read about all the hot button issues, like security, e-learning, wireless technologies, single sign-on methods, new XML standards for transmission of data over the internet and the industrywide switch from using fractions to using decimals to quote stocks.

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Opinion | Sound Off

Taking Sides on Critical Issues

Should Spam Be Outlawed?

BY MARTHA HELLER

SPAM IS ANNOYING. It crowds inboxes, hawks porno sites and “get rich” schemes, and, unlike the junk mail of yesteryear, it clogs networks and forces consumers to foot the bill for download time. Like all things loathsome, it should be banned. Or so a group of anti-spam activists implies with its latest assault.

The Forum for Responsible and Ethical E-mail (FREE), Chooseyourmail.com (a for-profit outfit that bills itself as a “responsible marketing alternative to spam”) and the Coalition Against Unsolicited Commercial E-mail (CAUCE) have denounced a service that the Direct Marketing Association launched last week and have reiterated their call for legislation that will put federal reins on spam.

The DMA’s Electronic Mail Preference Service (e-MPS at www.e-mps.org) is an “opt-out” database where spam-hating consumers can register with the understanding that responsible marketers (and all members of the DMA) will clean their lists of all registered names. “One of our greatest fears is that e-MPS is going to encourage the use of spam among its member companies that haven’t yet considered it,” says John Mozena, cofounder and vice president of CAUCE. “DMA has

been the source of information on direct marketing for decades, so its members may say, ‘If this is the DMA’s policy for e-mail marketing, it must be right.’”

Along with promoting spam among companies that haven’t yet employed it, say anti-spammers, e-MPS threatens the passage of anti-spam bills pending in Congress. “E-MPS is just a smoke screen,” says Ian Oxman, president of Chooseyourmail.com and co-organizer of a boycott against e-MPS. “It’s the DMA saying ‘don’t regulate us; we’re doing it ourselves.’”

While most anti-spammers would admit that legislation is a last resort, they are pushing for it hard. Both CAUCE and FREE are behind legislation that would force spammers to respect the “no soliciting here” policies posted by whole domains, such as corporations and ISPs. Because most corporations and ISPs interested in keeping their networks clean and their users protected would in all likelihood post such poli-



ILLUSTRATION BY PETER HOEY

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Your hardest problems.
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IP network service.
Network security. And much more.
Arcstar offers one-stop end-to-end
services using the latest technology to provide real
solutions to your real needs.

Better Solutions Found.

A trusted solution service
from NTT Communications

Arcstar

Global Network Services

Global Managed Bandwidth Service / Global Managed Frame Relay Service
Global IP Fax Service / Global EBN Service (IP-VPN Service)

Global High-speed Digital Leased Circuit Service
Global ATM Service / Global IP Backbone Service

Comprehensive One-Stop Services

One-stop Shopping Service

• Applications handled at a single contact point
(International communications lines, local access lines)

One-stop Billing Service

• Multiple bills into a single statement at a single location
• Local currency or any major currency • Split billing upon request

One-stop Maintenance Service

• 24-hour global network management
(English / Japanese)

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cies, spammers would be out of business.

If anti-spam legislation is approved by Congress, marketers will be prohibited from using a potentially powerful marketing tool. But are we throwing the baby out with the bathwater? Certainly it should be illegal to send porno spam to minors. It's hard to argue with that. But should the same rules apply to reputable marketers seeking an audience?

Plain and simple: Should spam be outlawed? This thread began Jan. 19, 2000. Here are some responses that Web Writer Martha Heller received. You can respond to her by e-mail at mheller@cio.com or via the web at comment.cio.com.

What's Your Take on Spam?

Want to sound off on this or other topics? Join the ongoing debates at comment.cio.com.

GARBAGE E-MAIL SHOULD COME WITH A PRICE TAG. Rather than trying to ban unwanted e-mail and all the associated legislation that would be required to determine what actually constitutes junk e-mail, I would prefer to see something more along the lines of a standard built within the SMTP mail header. It would be based on that value so you would know who the sender was, where it originated, who the author was and how much that company would deposit to your cyber-account for taking your time to read it. Then, you could use mail clients to filter commercial e-mail based on the parameters of your choice. If someone sent you a commercial e-mail message and you weren't going to get paid to read it, you could just delete it rather than waste your time.

Eric Kimminau

Webmaster

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eric@kimminau.org

THE PROBLEM WITH ANY DISCUSSION CONCERNING spam and its legislation is that very few people on this continent even understand legislation and the government's constitutional role. I'm not a spam advocate by any stretch of the imagination. At this rate I won't be surprised if it becomes a key "smoke and mirror" part of the 2000 election platform! However, we need to give the power to the local jurisdiction and support private enforcement. If a spam offender is sending material that violates obscenity and decency laws then it should face legal repercussions. If a spam offender is simply violating an ISP or a business's posted "No Soliciting" request, then local

jurisdictions should take the prescribed course of action. This is a matter of local concern, if any concern at all.

Jesse B. Crabbe

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OUTLAW SPAM? THE ANSWER DOESN'T LIE IN GOVERNMENT intervention, it lies in us. Every time you receive spam, reply to it. Reverse the trend. Wouldn't it be great if the ISPs could establish a "National Reply to Spam Month," where everyone would reply 10 times to every piece of spam received?

My idea is just as ludicrous as establishing anti-spam policy at any government level. It's an overreaction to what at worst is a slight annoyance.

Chris Stones

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THE ONLY SOLUTION TO SPAM IS LEGISLATION THAT NOT only holds spammers responsible and prosecutes them aggressively, but legislation that also holds responsible the ISPs from whose servers spam originates. One option may be to force spammers to include a flag that identifies them appropriately, so that filters could automatically block them, and to treat violators the same way we treat perpetrators of mail fraud. Spammers give all those of us who try to use the internet responsibly a bad name.

Paul Paetz

Director, e-Business Strategy

Netron

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I THINK YOU HIT THE PROVERBIAL NAIL ON THE HEAD when you stated that we may be throwing out the baby with the bathwater. I get as many unsolicited e-mails as the next person, but some of them are interesting enough for me to respond to.

As a marketing director, I can't say that it isn't a convenient, cost-effective means of communication. However, we have been leery to employ it because of the proposed legislation. We are a small firm and a lawsuit could sink us.

I have always felt that the marketplace should take care of itself without the interference of the government. I think we need less legislation, not more.

Mary Blankenship

Marketing Director

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Opinion Face Off

Two Sides to Every Question

Should You Watch Them on the Web?

According to a Vault.com survey of internet use, 90.3 percent of employees admit to surfing non-work-related sites at some point during the average workday, and 83.6 percent

of employees say they send personal e-mails from their office computers. Managers should be scrambling to scrutinize server logs to prevent this epidemic of goofing off, right?

Wrong. Eighty-two percent of employers allow their employees to spend a reasonable amount of time surfing the web and sending personal e-mails. That's because most employers recognize that using the internet for errands or short personal breaks has become part of the fabric of normal human behavior. And as

employees spend more time in the office, they turn to the web to handle the details of their personal and professional life.

Some employers think personal web use has made their employees more efficient. One manager surveyed prefers personal e-mail to phone calls because e-mail is much less distracting to other employees.

There will always be some employees who will use the web to surf excessively, just as there will always be some employees who take half-hour cigarette breaks on a regular basis, or conveniently get "sick" every Friday. But the answer is not to monitor the web use of employees—a so-called solution that breeds resentment and distrust among employees, and wastes time, money and valuable IT resources to catch a small number of truly abusive web surfers.

Managers should do what they've always done: monitor the productivity of employees and deal with underperformers accordingly. Employers who respect the personal time of their employees and trust them to use the web responsibly will reap the benefits of a content and web-savvy workforce. ■

MARK OLDMAN

COFOUNDER
VAULT.COM
NEW YORK CITY

no

yes

JAMES UNDERWOOD

SENIOR NETWORK
SYSTEMS ANALYST
CANON INFORMATION
SYSTEMS
IRVINE, CALIF.

The internet has created new opportunities and risks for companies, including productivity problems, bandwidth concerns and legal issues. Controlling employee internet usage protects both companies and employees.

If monitoring employees sounds invasive, ask yourself this: Is it fair to fire an employee for visiting an inappropriate website, or is it bet-

ter for the company to keep the misuse from happening in the first place?

The internet has given workers access to new information at their desktops. This recreational surfing can cost companies millions of dollars in lost productivity. With most employees having slow modem connections at home, more and more workers are using their companies' connections for their leisure surfing.

Employees who misuse the internet to access pornography, hate groups or other controversial sites can land a company in hot water. Viewed by an offended coworker, such access could bring lawsuits upon a company. Nearly two out of three companies nationwide have disciplined employees, and nearly one out of three have fired employees for internet misuse in the workplace, according to a recent survey from Websense and the Center for Internet Studies.

Companies need to have an enforceable internet-usage policy that clearly outlines what is acceptable and what isn't, and they need tools to enforce that policy. Tools exist that let companies customize internet monitoring and filtering, allowing them to set a policy that protects the company but still recognizes that non-work-related internet usage might be allowable in some instances. For example, companies can set a limit on how many non-work-related sites can be visited, or specify that shopping and banking sites can be viewed only after hours.

Most companies have clear policies regarding use of the phone and other company-owned materials. Why wouldn't companies choose to implement an internet-usage policy and enforce it to curb abuses before they happen? ■

Which side of the debate are you on? Visit comment.cio.com and make your thoughts known. Send column ideas to faceoff@cio.com.



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Opinion | Re:

A Battle Redux
IT Opportunism

OS Wars Revisited

BY WILLIAM F. ZACHMANN

THE OS WARS ARE BACK! The conjunction of Windows 2000 and Linux heralds a return to the OS battlefield, where Microsoft and IBM fought primarily for the desktop in the early 1990s. The OS war of the early 2000s will be fought for control of the server.

Windows trounced OS/2 in the '90s, sending the latter scurrying off to a minor server niche. IBM Chairman and CEO Louis V. Gerstner abjectly admitted defeat, saying that "the battle for the desktop" was over.

Most analysts assumed that meant the end of the OS wars. Any future challenge to the Microsoft platform would come, they said, in some other form—internet browsers, network computers, Java or whatever. Most analysts were wrong, of course.

The OS wars were not over, only temporarily suspended. Although IBM withdrew in humiliation from the desktop battlefield, Big Blue continued to look for ways to counterattack, backing and sponsoring just about every even-remotely plausible anti-Microsoft, anti-Windows option. As the core member of what I have long called the ABM (anything but Microsoft) coalition, IBM became the deep-pocketed, quiet



partner for all those new technologies that were supposed to make Windows irrelevant.

IBM buddied up with Sun Microsystems, lobbying intensely to help move Java through the international standards process despite Sun's insistence on proprietary control of Java that was every bit as tight as Microsoft's control of Windows. IBM palled around with Oracle, trying to give a boost to Larry Ellison's effort to replace PCs with NCs. IBM backed everything internet related that might somehow undermine Windows. And, of course, IBM lobbied the U.S. Department of Justice to "do something" about Microsoft, covertly funding background legal research to help build an antitrust case against Bill Gates & Co.

IBM and friends did manage to get the DOJ to hit Microsoft with an antitrust lawsuit but basically got nowhere with the rest of it. The spectacular success of the internet did not at all

ILLUSTRATION BY DAVY LIU



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have the claimed effect of making Windows irrelevant. On the contrary, it increased demand for PCs and strengthened Microsoft's hold on desktop operating systems.

The internet browser turned out to be just one more PC application, not the Windows-killer platform analysts touted

form for serious applications in thousands of organizations.

Windows 2000 brings another major advance by Microsoft straight into the heart of IBM's core enterprise server business. It further raises the level at which Intel-based servers running Windows can offer low-cost alternatives to IBM's traditional S/390 and AS/400 systems.

Having failed to stop Microsoft at the desktop, and having failed again to find some internet-related anti-Microsoft champion, IBM and friends are now on the brink of a battle for their very survival. Over the next few years, as Wintel servers mature into serious rivals that can offer equal or greater capabilities at lower cost, tra-

ditional proprietary or semiproprietary server systems like IBM's and Sun's will be increasingly on the defensive.

This is where Linux comes in and where the OS wars resurface. Ironically, after the failure of all the internet-related platform alternatives, Microsoft's foes are right back where they started, trying to oppose Windows directly with another operating system for Intel platforms. More ironically, the latest and perhaps last anti-Microsoft champion to which IBM and friends have turned to save them from Windows is none other

Over the next few years, traditional proprietary or semiproprietary server systems like IBM's and Sun's will be increasingly on the defensive.

it to be. The NC proved to be nearly a total dud and no threat to any but those who bet their careers on it. Java revealed itself to be little more than a nice programming language limited by relatively poor performance and Sun's insistence on proprietary control.

Meanwhile, Windows slowly gained ground from the bottom up on servers with Windows NT, steadily advancing on IBM's core turf: industrial-strength servers. While still underestimated by most analysts, NT is proving to be a viable plat-

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than Linux, Linus Torvalds' open-source version of Unix that he developed in 1991.

IBM executive Sam Palmisano, who, according to *The Wall Street Journal*, is widely identified by analysts and other observers as the likely heir to Gerstner, early this year appointed Irving Wladawsky-Berger as vice president of technology and strategy to spearhead IBM's efforts to make Linux a serious rival to Windows. As he did so, he told the *Journal*: "This is the first step in our vision to revitalize IBM's server business."

The greatest irony of all is that to the extent that Linux may succeed as an anti-Windows alternative, it is far more likely to accelerate, rather than retard, the pace at which powerful Intel-architecture servers undermine the remaining demand for IBM's (and others') proprietary and semiproprietary enterprise servers. If Palmisano and Gerstner really believe that promoting Linux can help revitalize IBM's server business, then IBM is surely doomed. For Intel-architecture, servers running Linux are potentially an even greater threat to IBM's server business than those running Windows 2000. **CIO**

William F. Zachmann is president of Canopus Research, a market research firm in Duxbury, Mass.

What's Wrong with IT?

BY GUS STRASSBURGER

IT IS HARD TO IMAGINE a more maligned professional than the IT executive. It seems that year after year, business and trade publications are filled with articles about IT failures, how to improve the IT contributions, how IT can better serve the company, how to create the perfect IT organization and so on and so forth.

Maybe it's because IS is still a relatively young profession, or maybe it's because CEOs still don't understand fully the best way to use IT. In my many and varied years as an IT executive, I have seen and been involved in both good and bad experiences with technology. So I've had to learn some things the hard way, and I've seen that there are some techniques, approaches and philosophies that work better than others.

As your company expands, so must your ability to communicate with your customers. It's best if you pick a provider who will stay with you as you grow – not only one with ample bandwidth today, but one who will design a solution for your specific applications and help you plan ahead. Better yet, find one who will monitor your network use and alert you when they see evidence of a growth spurt.

Electric Lightwave works that way. Our fiber-based network is engineered to scale with market demand. The network and our progressive suite of products are designed to be a step ahead of our customers' growth plans – letting you migrate seamlessly from frame relay to ATM, or from a single-office business to a national enterprise.

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The logo for Electric Lightwave, featuring the company name in a bold, sans-serif font with a stylized graphic element to the left.

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potential. Let it grow.

I've concluded that our profession can benefit from a Top 10 list of the key success factors for IT executives.

10. Job title/reporting relationship: We've gone through data processing manager, MIS director, VP of IS, VP of IT and CIO. Now we hear about CTO (chief technology officer), CKO (chief knowledge officer), CWO (chief wisdom officer) and

Create opportunities through personal leadership. Focusing on the external customer and e-business is a logical place to start.

CCO (chief change officer). Who knows what's next—maybe EIEIO (executive internet, extranet, intranet officer)? Don't let your job title become a distraction—it's what you do that matters. To impact and support the business goals, it's necessary to report to the CEO. If this is not immediately possible, do everything necessary to have regular contact and influence with the CEO and other senior managers.

9. Communications: Avoid jargon, "guruisms," silver bullets and fads. Deal in business terms and issues.

8. IT architecture/infrastructure: Create and maintain a solid backbone that promotes reliability, accessibility, security and ease of use. Follow FISS (flexible, integrated, simple and standard) guidelines. Use "technology tough love" to avoid technology that has more glitter than business value. Outsource what makes sense.

7. IT strategy: Incorporate IT value-adding activities to business strategy, and seek ways to have an integrated process to do this continually. Incorporate the needs of customers and stockholders, and ensure that key IT staff members are involved and in tune with each of the business units so that ideas are related to true opportunities.

6. IT staff: Your crown jewels! Proper care and feeding of the staff is important. (Yes, feeding—a few doughnuts in the morning or ice cream in the afternoon will do wonders for morale and productivity!) Create IT staff motivation, retention, productivity and career-planning guidelines. Maintain a personal touch and lead by example. Seek and accept staff ideas and input. Develop core competencies based on business needs, and develop individual career plans consistent with these needs and personal desires and abilities.

5. Perfection and timeliness: Perfection should be the goal for your data; strive to design and maintain it as accurately and accessibly as possible. On the other hand, projects themselves need to be timely. Avoid the 90-percent-complete syndrome. Use project management techniques with regular review and reporting, and make sure that projects are phased in, with deliverables at least every six months.

4. Focus and quality: You can't do it all, and it is better to do a few things right that really make an impact on the business. Get executive managers to set priorities based on their business needs. Avoid unchecked use of IT resources on supporting current systems. Never, ever give in to implementing new applications before they are ready.

3. Think like an owner, act like a consultant: Become an advocate for using technology only when there is measurable benefit to the organization. Create an awareness of technology's costs throughout the IT organization. Develop documentation to support your ideas and recommendations that shows rational thought, consideration of alternatives and risks. Give credit where it's due. Publicize successes and learn from mistakes.

2. Alignment: This will not go away until we get it and do it right. Building the proper relationships with mutual trust and credibility of IT takes constant attention and emphasis. Adding business value is what it is all about—make sure that there is IT support for all important business initiatives and that input on innovative and proven ways to use technology is provided constantly to the business units.

1. Carpe diem: Create opportunities through personal leadership. Focusing on the external customer and e-business is a logical place to start.

There is no organization today that is doing all it can to leverage technology for business advantage. In that regard IT detractors may be right, and this very fact becomes the starting point for success. Take advantage and make a difference! **CIO**

Do you have an opinion you would like to express? Let Senior Editor Megan Santosus know at santosus@cio.com.

Following a 10-year post as CIO at Fortis Family in Atlanta, Gus Strassburger is currently an independent IT management consultant.



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Opinion | From the Publisher

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Innovate or Separate

ON MAY 24, JUDGE Thomas Penfield Jackson begins the remedy phase of the *Microsoft v. Department of Justice* case. How this part of the infamous trial concludes will have a direct impact on CIOs.

This case boils down to two opposing positions: Microsoft's claim that it has the right to innovate, and the Department of Justice's point of view that the Windows operating system constitutes a monopoly that needs to be carefully watched—a monopoly that bundles products into Windows to harm competitors and consumers, though the nearly 2-year-old case has come up dramatically short on parading consumer victims into the courtroom.

Does Microsoft have a corporate legacy as an innovator? If so, what is the most prominent technology product the company has truly innovated?

Microsoft first hit it big in the early '80s by licensing MS-DOS to IBM for its personal computer products. But MS-DOS was in reality a quick-and-dirty DOS built by another Seattle-based software company. Not Microsoft.

What about Windows? Surely Microsoft was an innovator there? Afraid not. Computer scientists like Douglas Englebart back in the late 1960s invented the idea of partitioning computer screens into windows. Xerox's Palo Alto Research Center further developed the windowing idea in the '70s, and then Steve Jobs and Bill Gates brought the concept to the masses with the Macintosh and Windows operating systems in the mid to late 1980s.



Gary J. Beach

So what is Microsoft's historical claim to innovation? Probably Windows NT/Windows 2000, though some claim that early versions of WinNT had huge chunks of Digital Equipment Corp.'s VMS operating system embedded in it.

At the crux of the antitrust case is Microsoft's Internet Explorer browser. Did Microsoft invent Internet Explorer? No, it didn't. Explorer's heritage is licensed software code from Naperville, Ill.-based Spyglass.

So, what has Microsoft truly innovated? A perusal of the U.S. Patent and Trademark Office's website shows the PTO has assigned over 700 patents to Microsoft since 1995, but most of those awarded are for arcane devices and software code.

Which leads to my remedy for Judge Jackson. March into the courtroom May 24 and say to Microsoft, "I believe every company has the right to innovate. And going forward if Microsoft truly innovates (a.k.a. invents) a product, then you are free to bundle that product into Windows software code immediately, if you so wish. However, if you use your \$18 billion cash hoard to license or acquire a piece of technology, while you are free to sell that product immediately as a separate offering, you must wait 24 months before bundling it into the Windows operating system."

Simple. Clean. It gives Microsoft an incentive to innovate. And puts to rest forever its B-to-B strategy of "buying to bundle," a strategy many feel should not be in Microsoft's future.

What do you think? Should Judge Jackson follow this advice? Drop me an e-mail at gbeach@cio.com.

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Reporter Dispatch

The New Values System



What if they're a bunch of uptight, privileged snobs with their hotshot Nokias and Bill Gates-business-casual khakis? This flashed through my mind as I set up my interviews with MBA students for my story on the class of 2001 at MIT's renowned Sloan School of Management (see Page 202).

Hardly college "kids," these students had already spent several years in the business world, schmoozing and networking. What's more, these students made enough money during their professional stints to cover the \$56,400 tab to attend Sloan for two years—not to mention the high cost of living in Boston.

But each student I met proved to be the diametric opposite of the stuffed-shirt stereotype I'd imagined. These down-to-earth, gregarious individuals taught me more about the business world than I had learned in my 22 months at *CIO*.

More important, they taught me lessons about life.

In the stately lobby of the Sloan building, between swigs of coffee from a 20-ounce cup, 31-year-old Sandeep Swadia discussed his view of the internet era of business. But this was not another monologue on stock options and instant wealth; Swadia talked about integrity. Born in Bombay, India, he explained the concept of integrity in the terms of the Vedas—ancient Hindu poems—as “what you do when you're alone.” Integrity, according to Swadia's interpretation, means that you are the same person to everyone you encounter as you are when you are by yourself. He believes integrity is a core value that all businesses and leaders need to embrace in order to build trust with customers, partners and employees. “If you want to transform the world,” he says, “you have to have these core values. You can't shop for them.”

When it comes to IT, *value* is an important word in a CIO's lexicon. But CIOs can learn from Swadia and his peers, as I did, that the plural form of that word, which has a slightly different meaning, is just as important in business as it is in life.

—Meridith Levinson, Staff Writer

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Time Piece

The Ticker

SILENTLY, it streams across our desktops, but its onomatopoetic name still applies: the ticker, capitalism's seismograph, recording the tremblers of money shaping and reshaping the economic landscape.

Before the ticker, the secret life of cash was known only to the J.P. Morgans of the world, and that knowledge allowed them to build empires that astounded the Gilded Age. Then the ticker came along, wantonly spilling their secrets to anyone who could get through the doors of a brokerage.

The first stock ticker, essentially a

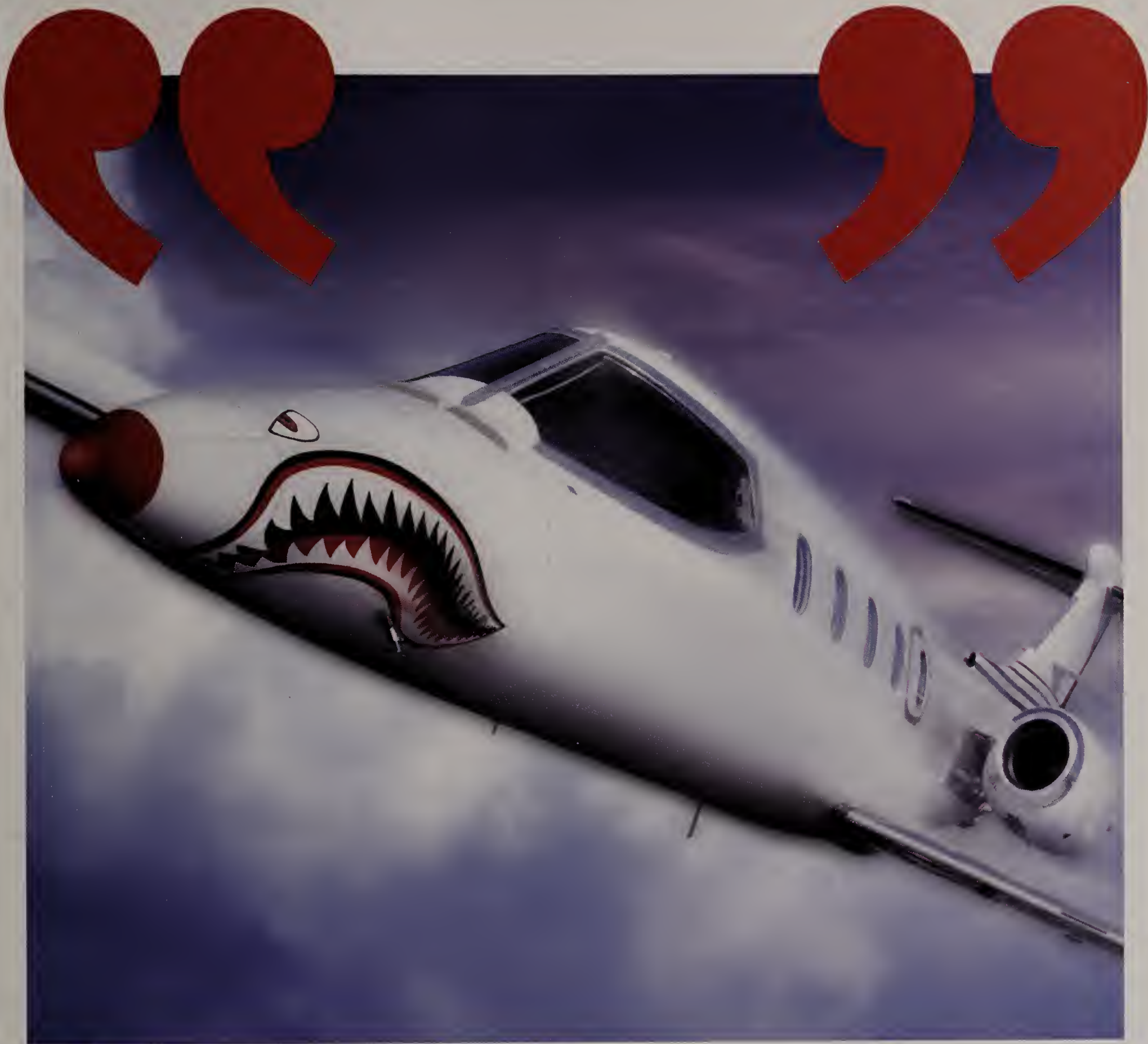
telegraphic printer, was invented in 1867 by Edward A. Calahan, but it was perfected and given its transcendent form—a seductively revealing glass dome atop a sturdy wooden pedestal—in 1869 by the ubiquitous Thomas Edison. Leveraging the telegraph lines laid along the transcontinental railroad, the Edison Universal Stock Ticker connected the farthest outposts of the

nation to the New York Stock Exchange, spreading the gospel of the free market.

Today, facilitated by the internet, watching the ticker has become a national pastime and so central to our culture that we use its name to refer to another machine that tracks the ups and downs of the market. And how is the ole ticker, anyway? **CIO**



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